Volume 4

DRAFT ENVIRONMENTAL IMPACT REPORT

Rowland Heights Plaza and Hotel Project

Rowland Heights, Los Angeles County, California

Appendices I through J

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VOLUME 4

DRAFT ENVIRONMENTAL IMPACT REPORT

ROWLAND HEIGHTS PLAZA AND HOTEL PROJECT

ROWLAND HEIGHTS, LOS ANGELES COUNTY, CALIFORNIA

APPENDICES I THROUGH J

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Table of Contents

Page

VOLUME 1

EXECUTIVE SUMMARY ES-1

1.0 INTRODUCTION 1-1

2.0 PROJECT DESCRIPTION 2-1

3.0 GENERAL DESCRIPTION OF ENVIRONMENTAL SETTING 3-1

4.0 ENVIRONMENTAL IMPACT ANALYSIS

4.A Aesthetics 4.A-1
4.B Air Quality 4.B-1
4.C Biological Resources 4.C-1
4.D Cultural Resources
4.D.1 Archaeological Resources 4.D.1-1
4.D.2 Paleontological Resources 4.D.2-1
4.E Geology and Soils 4.E-1
4.F Greenhouse Gas Emissions 4.F-1
4.G Hydrology and Water Quality 4.G-1
4.H Land Use and Planning 4.H-1
4.I Noise 4.I-1
4.J Public Services
4.J.1 Fire Protection and Emergency Services 4.J.1-1
4.J.2 Sheriff Protection 4.J.2-1
4.K Transportation and Parking 4.K-1
4.L Utilities and Service Systems
4.L.1 Wastewater 4.L.1-1
4.L.2 Water Supply 4.L.2-1

5.0 ALTERNATIVES 5-1

6.0 OTHER CEQA CONSIDERATIONS 6-1

7.0 REFERENCES 7-1

8.0 LIST OF EIR PREPARERS AND ORGANIZATIONS AND PERSONS CONTACTED 8-1

9.0 ACRONYMS AND ABBREVIATIONS 9-1

Table of Contents (Continued)

VOLUME 2

APPENDICES

APPENDIX A: Notice of Preparation (NOP), Initial Study, Scoping Meeting Materials, and NOP and Scoping Meeting Comments

- **A-1:** NOP
- **A-2:** Initial Study
- **A-3:** Scoping Meeting Materials
- **A-4:** Scoping Meeting Sign-In Sheet and NOP Comments

APPENDIX B: Air Quality Data Worksheets

APPENDIX C: Cultural Resources Documentation

- **C-1:** Native American Consultation Documentation
- **C-2:** Paleontological Records Search Results

VOLUME 3

APPENDIX D: Geotechnical Reports

- **D-1:** Geotechnical Investigation and Liquefaction Evaluation
- **D-2:** Update of Geotechnical Report and Conceptual Grading Plan Review

APPENDIX E: Greenhouse Gas Emissions Data Worksheets

APPENDIX F: Hydrology Study and Low Impact Development

- **F-1:** Hydrology Study
- **F-2:** Low Impact Development

APPENDIX G: Noise Data Worksheets

APPENDIX H: Service Provider Correspondence

- **H-1:** Fire Department Correspondence
- **H-2:** Sheriff's Department Correspondence

VOLUME 4

APPENDIX I: Traffic and Parking

- **I-1:** Traffic Impact Analysis
- **I-2:** Parking Assessment

APPENDIX J: Utilities and Service Systems

- **J-1:** Sewer Capacity Study
- **J-2:** Water Supply Availability Supporting Information

VOLUME 5

APPENDIX K: Alternatives Analysis

- **K-1:** Air Quality, Greenhouse Gas Emissions, and Noise Data Worksheets for Alternatives
- **K-2:** Trip Generation Worksheets for Alternatives

APPENDIX I

TRAFFIC AND PARKING

I-1: TRAFFIC IMPACT ANALYSIS

KUNZMAN ASSOCIATES, INC.

ROWLAND HEIGHTS PLAZA

TRAFFIC IMPACT ANALYSIS

December 2, 2015

Traffic Engineering | Transportation Planning | Parking | Noise/Vibration | Expert Witness
Air Quality | Global Climate Change | Health Risk Assessment

KUNZMAN ASSOCIATES, INC.

ROWLAND HEIGHTS PLAZA

TRAFFIC IMPACT ANALYSIS

December 2, 2015

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Table of Contents

I. Findings 2
A. Definition of Deficiency and Significant Impact 2
B. Existing Traffic Conditions 2
C. Traffic Impacts 4
D. Recommendations 6

II. Congestion Management Program Methodology 7
A. County Congestion Management Program 7
B. Prescribed Methodology for a Traffic Impact Analysis 7
C. Mitigation Measures 9

III. Project Description 10
A. Location 10
B. Proposed Project 10

IV. Existing Traffic Conditions 13
A. Surrounding Street System 13
B. Existing Travel Lanes and Intersection Controls 14
C. Existing Average Daily Traffic Volumes 14
D. Existing Levels of Service 14
E. Existing County of Los Angeles Highway Plan 15
F. Transit Service 15
G. Freeway Off-Ramp Vehicle Queue Analysis 15
H. Freeway Ramp Delay Calculations 15

V. Project Traffic 24
A. Trip Generation 24
B. Trip Distribution 24
C. Trip Assignment 25
D. Modal Split 25

VI. Existing Plus Project Traffic Conditions 39
A. Method of Projection 39
B. Existing Plus Project Average Daily Traffic Volumes 39
C. Existing Plus Project Levels of Service 39
D. Existing Plus Project Traffic Signal Warrant Analysis 39
E. Significant Impact Evaluation 40
F. Freeway Off-Ramp Vehicle Queue Analysis 40
G. Freeway Ramp Delay Calculations 40

VII. Existing Plus Project Plus Cumulative Traffic Conditions 48
A. Method of Projection 48
B. Existing Plus Project Plus Cumulative Average Daily Traffic Volumes 48
C. Existing Plus Project Plus Cumulative Levels of Service 48
D. Significant Impact Evaluation 49
E. Project Significant Impact Mitigation Measures 49
F. Freeway Off-Ramp Vehicle Queue Analysis 50
G. Freeway Ramp Delay Calculations 50

H. Freeway Mainline Analysis 50
I. Intersection Improvements Striping Overlays 50

VIII. Recommendations 70
A. Roadway Improvements 70
B. Traffic Signal Warrant Analysis 70
C. Project Significant Impact Mitigation Measures 70

APPENDICES

Appendix A – Glossary of Transportation Terms

Appendix B – Scoping Agreement

Appendix C – Traffic Count Worksheets

Appendix D – Explanation and Calculation of Intersection Capacity Utilization/Delay

Appendix E – Traffic Signal Warrant Worksheets

Appendix F – Pass-By Trips

Appendix G – California Department of Transportation Freeway Off-Ramp Queue Analysis

Appendix H – California Department of Transportation Highway Capacity Manual Level of Service Calculations

Appendix I – California Department of Transportation Freeway Mainline Analysis

Appendix J – Intersection Improvements Striping Overlays

List of Tables

Table 1. Existing Intersection Capacity Utilization and Level of Service 16
Table 2. Project Trip Generation 26
Table 3. Existing Plus Project Intersection Capacity Utilization and Level of Service 42
Table 4. Existing Plus Project Significant Impact Evaluation 43
Table 5. Related Projects Trip Generation 51
Table 6. Existing Plus Project Plus Cumulative Intersection Capacity Utilization and Level of Service 52
Table 7. Existing Plus Project Plus Cumulative Significant Impact Evaluation 53
Table 8. Project Fair Share Calculations 54

List of Figures

Figure 1. Project Location Map 11
Figure 2. Site Plan 12
Figure 3. Existing Through Travel Lanes and Intersection Controls 17
Figure 4. Existing Average Daily Traffic Volumes 18
Figure 5. Existing Weekday Morning Peak Hour Intersection Turning Movement Volumes 19
Figure 6. Existing Weekday Evening Peak Hour Intersection Turning Movement Volumes 20
Figure 7. Existing Saturday Mid-Day Peak Hour Intersection Turning Movement Volumes 21
Figure 8. Los Angeles County Highway Plan 22
Figure 9. Foothill Transit System Map 23
Figure 10. Project Outbound Trip Distribution – Retail 27
Figure 11. Project Inbound Trip Distribution – Retail 28
Figure 12. Project Outbound Trip Distribution – Restaurant 29
Figure 13. Project Inbound Trip Distribution – Restaurant 30
Figure 14. Project Outbound Trip Distribution – Hotel 31
Figure 15. Project Inbound Trip Distribution – Hotel 32
Figure 16. Project Outbound Trip Distribution – Office 33
Figure 17. Project Inbound Trip Distribution – Office 34
Figure 18. Project Average Daily Traffic Volumes 35
Figure 19. Project Weekday Morning Peak Hour Intersection Turning Movement Volumes 36
Figure 20. Project Weekday Evening Peak Hour Intersection Turning Movement Volumes 37
Figure 21. Project Saturday Mid-Day Peak Hour Intersection Turning Movement Volumes 38
Figure 22. Existing Plus Project Average Daily Traffic Volumes 44
Figure 23. Existing Plus Project Weekday Morning Peak Hour Intersection Turning Movement Volumes 45
Figure 24. Existing Plus Project Weekday Evening Peak Hour Intersection Turning Movement Volumes 46
Figure 25. Existing Plus Project Saturday Mid-Day Peak Hour Intersection Turning Movement Volumes 47
Figure 26. Related Projects Location Map 55

Figure 27. Related Projects Outbound Trip Distribution - 90242 ... 56
Figure 28. Related Projects Inbound Trip Distribution – 90242 ... 57
Figure 29. Related Projects Outbound Trip Distribution - 97097 ... 58
Figure 30. Related Projects Inbound Trip Distribution - 97097 ... 59
Figure 31. Related Projects Outbound Trip Distribution – R2012-00006 ... 60
Figure 32. Related Projects Inbound Trip Distribution – R2012-00006 ... 61
Figure 33. Related Projects Average Daily Traffic Volumes ... 62
Figure 34. Related Projects Weekday Morning Peak Hour Intersection Turning Movement Volumes ... 63
Figure 35. Related Projects Weekday Evening Peak Hour Intersection Turning Movement Volumes ... 64
Figure 36. Related Projects Saturday Mid-Day Peak Hour Intersection Turning Movement Volumes ... 65
Figure 37. Existing Plus Project Plus Cumulative Average Daily Traffic Volumes ... 66
Figure 38. Existing Plus Project Plus Cumulative Weekday Morning Peak Hour Intersection Turning Movement Volumes ... 67
Figure 39. Existing Plus Project Plus Cumulative Weekday Evening Peak Hour Intersection Turning Movement Volumes ... 68
Figure 40. Existing Plus Project Plus Cumulative Saturday Mid-Day Peak Hour Intersection Turning Movement Volumes ... 69
Figure 41. Circulation Recommendations ... 71

ROWLAND HEIGHTS PLAZA

TRAFFIC IMPACT ANALYSIS

This report contains the traffic impact analysis for the Rowland Heights Plaza project. The project site is located north of Gale Avenue between Coiner Court and Nogales Street in the unincorporated Rowland Heights area of Los Angeles County. The proposed project consists of 83,707 square feet of shopping center, 40,113 square feet of restaurant, 2,000 square feet of office, and two hotels totaling 477 rooms.

The traffic impact analysis contains documentation of existing traffic conditions, trips projected to be generated by the project, distribution of the project trips to the local street network, calculation of existing plus project[1] traffic conditions, and an analysis of existing plus project plus cumulative traffic conditions with the project. Each of these topics is addressed in a separate section of the report. The first section summarizes the traffic impact analysis findings and subsequent sections expand upon the findings.

To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided within Appendix A.

[1] The existing plus project conditions has been analyzed to comply with the Sunnyvale West Neighborhood Association v. City of Sunnyvale CEQA court case. This scenario assumes the full development of the proposed project and full absorption of the proposed project trips on the circulation system at the present time. This scenario is provided for informational purposes only, and will not be used for impact determinations or mitigation.

I. Findings

This section summarizes the existing traffic conditions, project traffic impacts, and the proposed mitigation measures.

A. Definition of Deficiency and Significant Impact

The following definitions of deficiencies and significant impacts have been developed in accordance with the County of Los Angeles Congestion Management Program requirements and the County of Los Angeles Traffic Impact Analysis Report Guidelines.

The definition of an intersection deficiency has been obtained from the County of Los Angeles Congestion Management Program. The Congestion Management Program states that peak hour intersection operations of Level of Service E or better are generally acceptable, except where base year Level of Service is worse than Level of Service E. Therefore, any intersection operating at Level of Service E to F will be considered deficient.

Based on the Los Angeles County Traffic Impact Analysis Report Guidelines, an impact is considered significant if the project related increase in the volume to capacity (V/C) ratio equals or exceeds the thresholds shown below:

Significance Threshold for Intersections		
Level of Service	Volume/Capacity	Incremental Increase
C	0.71-0.80	0.04 or more
D	0.81-0.90	0.02 or more
E/F	0.91 - more	0.01 or more

B. Existing Traffic Conditions

1. The project site is not developed with any existing buildings or structures and does not generate any significant trips. On-site improvements include a partially channelized storm drain at the northern end of the property, and temporary roadway improvements and construction staging facilities created in 2013 by the Alameda Corridor East (ACE) Construction Authority in conjunction with the nearby on-going Nogales Street Grade Separation Project.

   In 2013, ACE constructed a three-lane detour road within a temporary construction easement on the project site, together with a temporary at-grade railroad crossing at the northern property line, to provide north/south vehicular access between Railroad Avenue and Gale Avenue, since the Grade Separation Project necessitated the closure of Railroad Avenue at Nogales Street and the closure of Nogales Street between Gale Avenue and San Jose Avenue. The temporary detour road, known as New Charlie Road, is approximately 40 feet in width and is signalized at its intersection with Gale Avenue. It incorporates a paved pedestrian sidewalk and box culvert/bridge crossing for the on-site storm drain. Temporary parking spaces were created on and adjacent to the project site, to replace parking temporarily displaced within the neighboring

Rowland Heights Plaza Shopping Center as the result of construction for the Grade Separation Project. Finally, an access road and two-acre construction staging area were constructed in the southeast corner of the project site. All of the Grade Separation Project site improvements will be removed once the project is completed, at which point, traffic patterns in the project vicinity are expected to return to normal.

2. Based on the County approved scoping agreement for the traffic impact analysis, the study area includes the following intersections (see Appendix B):

Fullerton Road (NS) at:
- Gale Avenue (EW) - #1
- SR-60 Freeway WB Ramps (EW) - #2
- SR-60 Freeway EB Ramps (EW) -#3
- Colima Road (EW) - #4

Coiner Court (NS) at:
- Gale Avenue (EW) - #5

Project West Access (NS) at:
- Gale Avenue (EW) - #6

Project Central Access (NS) at:
- Gale Avenue (EW) - #7

Project East Access (NS) at:
- Gale Avenue (EW) - #8

Nogales Street (NS) at:
- Shadow Oak Drive (EW) - #9
- La Puente Road (EW) - #10
- Valley Boulevard Loop (EW) - #11

Valley Boulevard Loop (NS) at:
- Valley Boulevard (EW) - #12

Nogales Street (NS) at:
- San Jose Avenue (EW) - #13
- Railroad Street (EW) - #14
- Gale Avenue/Walnut Drive (EW) - #15
- SR-60 Freeway WB Ramps (EW) - #16
- SR-60 Freeway EB Ramps (EW) - #17
- Colima Road (EW) - #18

3. The study area intersections currently operate within acceptable Levels of Service during the peak hours for Existing traffic conditions, except for the following study area intersection that is projected to operate at an unacceptable Level of Service during the peak hours (see Table 1):

Nogales Street (NS) at:
Gale Avenue/Walnut Drive (EW) - #15

C. Traffic Impacts

1. The proposed project consists of 83,707 square feet of shopping center, 40,113 square feet of restaurant, 2,000 square feet of office, and two hotels totaling 477 rooms.

2. The proposed development is projected to generate a total of approximately 10,357 weekday daily vehicle trips, 541 vehicles per hour will occur during the weekday morning peak hour, 846 vehicles per hour will occur during the weekday evening peak hour, and 1,092 vehicles per hour will occur during the Saturday mid-day peak hour (see Table 2).

3. The study area intersections are projected to operate within acceptable Levels of Service during the peak hours for Existing Plus Project traffic conditions, except for the following study area intersections that are projected to operate at unacceptable Levels of Service during the peak hours (see Table 3):

   Nogales Street (NS) at:
   Gale Avenue/Walnut Drive (EW) - #15

4. The project does significantly impact the following study area intersections for Existing Plus Project traffic conditions (see Table 4):

   Fullerton Road (NS) at:
   Gale Avenue (EW) - #1
   SR-60 Freeway EB Ramps (EW) - #3
   Colima Road (EW) - #4

   Nogales Street (NS) at:
   La Puente Road (EW) - #10
   San Jose Avenue (EW) - #13
   Gale Avenue/Walnut Drive (EW) - #15
   Colima Road (EW) - #18

5. Traffic signals are projected to be warranted at the following study area intersections for Existing Plus Project traffic conditions (see Appendix E):

   Project Central Access (NS) at:
   Gale Avenue (EW) - #7

   Project East Access (NS) at:
   Gale Avenue (EW) - #8

   The unsignalized intersections have been evaluated for traffic signals using the California Department of Transportation (Caltrans) Warrant 3 Peak Hour traffic signal warrant analysis, as specified in the California Manual of Uniform Traffic Control Devices (2014 Edition).

6. Related Projects within approximately one mile of the study area have been identified to evaluate cumulative traffic conditions (see Table 5).

7. The study area intersections are projected to operate within acceptable Levels of Service during the peak hours for Existing Plus Project Plus Cumulative traffic conditions, except for the following study area intersections that are projected to operate at an unacceptable Level of Service during the peak hours (see Table 6):

   Nogales Street (NS) at:
      Gale Avenue/Walnut Drive (EW) - #15

8. The project would significantly impact the following study area intersections for Existing Plus Project Plus Cumulative traffic conditions (see Table 7):

   Fullerton Road (NS) at:
      Gale Avenue (EW) - #1
      SR-60 Freeway EB Ramps (EW) - #3
      Colima Road (EW) - #4

   Nogales Street (NS) at:
      La Puente Road (EW) - #10
      San Jose Avenue (EW) - #13
      Gale Avenue/Walnut Drive (EW) - #15
      Colima Road (EW) - #18

9. A freeway off-ramp vehicle queuing analysis has been conducted for Fullerton Road (NS) at SR-60 Freeway WB off-ramp (EW), Fullerton Road (NS) at SR-60 Freeway EB off-ramp (EW), Nogales Street (NS) at SR-60 Freeway WB off-ramp (EW), and Nogales Street (NS) at SR-60 Freeway EB off-ramp (EW). The calculation has been conducted using the Highway Capacity Manual methodology. The freeway off-ramp vehicle queue is expected to be contained in the provided vehicle stacking area (see Appendix G).

10. A freeway ramp Delay methodology Level of Service analysis has been conducted for Fullerton Road (NS) at SR-60 Freeway WB ramps (EW), Fullerton Road (NS) at SR-60 Freeway EB ramps (EW), Nogales Street (NS) at SR-60 Freeway WB ramps (EW), and Nogales Street (NS) at SR-60 Freeway EB ramps (EW). The calculation has been conducted using the Highway Capacity Manual methodology. The freeway ramp intersections are expected to operate within acceptable Levels of Service without and improvements (see Appendix H).

11. A freeway mainline analysis has been conducted on the freeway segments within five (5) miles of the project site. The project is not projected to significantly impact the freeway mainline in the study area (see Appendix I).

D. Recommendations

1. Sight distance at the project accesses should be reviewed with respect to Caltrans/Los Angeles County standards in conjunction with the preparation of final grading, landscaping, and street improvement plans.

2. On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project.

3. As is the case for any roadway design, the County of Los Angeles should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

II. Congestion Management Program Methodology

This section discusses the County Congestion Management Program. The purpose, prescribed methodology, and definition of a significant traffic impact are discussed.

A. <u>County Congestion Management Program</u>

The Congestion Management Program is a result of Proposition 111 which was a statewide initiative approved by the voters in June 1990. The proposition allowed for a nine cent per gallon state gasoline tax increase over a five year period.

Proposition 111 explicitly stated that the new gas tax revenues were to be used to fix existing traffic problems and was not to be used to promote future development. For a city to get its share of the Proposition 111 gas tax, it has to follow certain procedures specified by the State Legislature. The legislation requires that a Traffic Impact Analysis be prepared for new development. The Traffic Impact Analysis is prepared to monitor and fix traffic problems caused by new development.

The Legislature requires that adjacent jurisdictions use a standard methodology for conducting a Traffic Impact Analysis. To assure that adjacent jurisdictions use a standard methodology in preparing Traffic Impact Analyses, one common procedure is that all cities within a county, and the county agency itself, adopt and use one standard methodology for conducting Traffic Impact Analyses.

Although each county has developed standards for preparing Traffic Impact Analysis's, Traffic Impact Analysis requirements do vary in detail from one county to another, but not in overall intent or concept. The general approach selected by each county for conducting Traffic Impact Analysis's has common elements.

The general approach for conducting a Traffic Impact Analysis is that existing weekday peak hour traffic is counted and the percent of roadway capacity currently used is determined. Then growth in traffic is accounted for and added to existing traffic and the percent of roadway capacity used is again determined. Then the project traffic is added and the percent of roadway capacity used is again determined. If the new project adds traffic to an overcrowded facility, then the new project has to mitigate the traffic impact so that the facility operates at a level that is no worse than before the project traffic was added.

If the project size is below a certain minimum threshold level, then a project does not have to have a Traffic Impact Analysis prepared, once it is shown or agreed that the project is below the minimum threshold. If a project is bigger than the minimum threshold size, then a Traffic Impact Analysis is required.

B. <u>Prescribed Methodology for a Traffic Impact Analysis</u>

The Traffic Impact Analysis must include all monitored intersections to which the project adds traffic above a certain minimum amount. In Los Angeles County, the monitored intersections are contained in Appendix A of the Congestion Management Program for the County of Los Angeles.

In Los Angeles County, the minimum project added traffic that is needed before an intersection has to be studied is if the project adds 50 two way trips in either the morning or evening weekday peak hour.

If a project adds more traffic than the minimum threshold amount to an intersection, then that intersection has to be analyzed for deficiencies.

If the intersection has to be analyzed for deficiencies, then mitigation is required if the existing traffic plus anticipated traffic growth plus project traffic does cause the Intersection Capacity Utilization to go above a certain point.

In Los Angeles County, the impact is considered significant if the project related increase in the V/C ratio equals or exceeds the thresholds shown below:

Significance Threshold for Intersections		
Level of Service	Volume/Capacity	Incremental Increase
C	0.71-0.80	0.04 or more
D	0.81-0.90	0.02 or more
E/F	0.91 - more	0.01 or more

An intersection mitigation measure is required to either fix the deficiency, or reduce the Intersection Capacity Utilization so that it is below the level that occurs without the project.

In Los Angeles County, the technique used to calculate Intersection Capacity Utilization is as follows. Lane capacity is 1,600 vehicles per lane per hour of green time for through and turn lanes, except that a capacity of 2,880 vehicles per lane per hour of green time is used for dual turn lanes. A total yellow clearance time of 10 percent is added.

Project trips are generated using rates and procedures contained in the Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012. Project trip distributions are provided by the reviewing agency or are agreed to in advance of the Traffic Impact Analysis being prepared. The Traffic Impact Analysis has to be prepared by a licensed Traffic Engineer.

This Traffic Impact Analysis has been prepared in accordance with the County's Traffic Impact Analysis requirements, except as noted. The Traffic Impact Analysis not only examines the Congestion Management Program system of roads and intersections, but also non Congestion Management Program system roadways and intersections including project access points.

The project generated trips were added to intersections, and a full intersection analysis was conducted.

C. Mitigation Measures

If a project is large enough to require that a Traffic Impact Analysis be prepared, and if the project adds traffic to an intersection above a minimum threshold, and if that incremental increase results in a V/C ratio that meets or exceeds the County's thresholds for an acceptable level of intersection operation, then the project must mitigate its traffic impact at that intersection.

III. Project Description

This section discusses the project's location and proposed development. Figure 1 shows the project location map and Figure 2 illustrates the site plan.

A. Location

The project site is located north of Gale Avenue between Coiner Court and Nogales Street in the unincorporated Rowland Heights area of Los Angeles County.

B. Proposed Project

The proposed project consists of 83,707 square feet of shopping center, 40,113 square feet of restaurant, 2,000 square feet of office, and two hotels totaling 477 rooms. The project site will be accessed directly from Gale Avenue.

Figure 1
Project Location Map

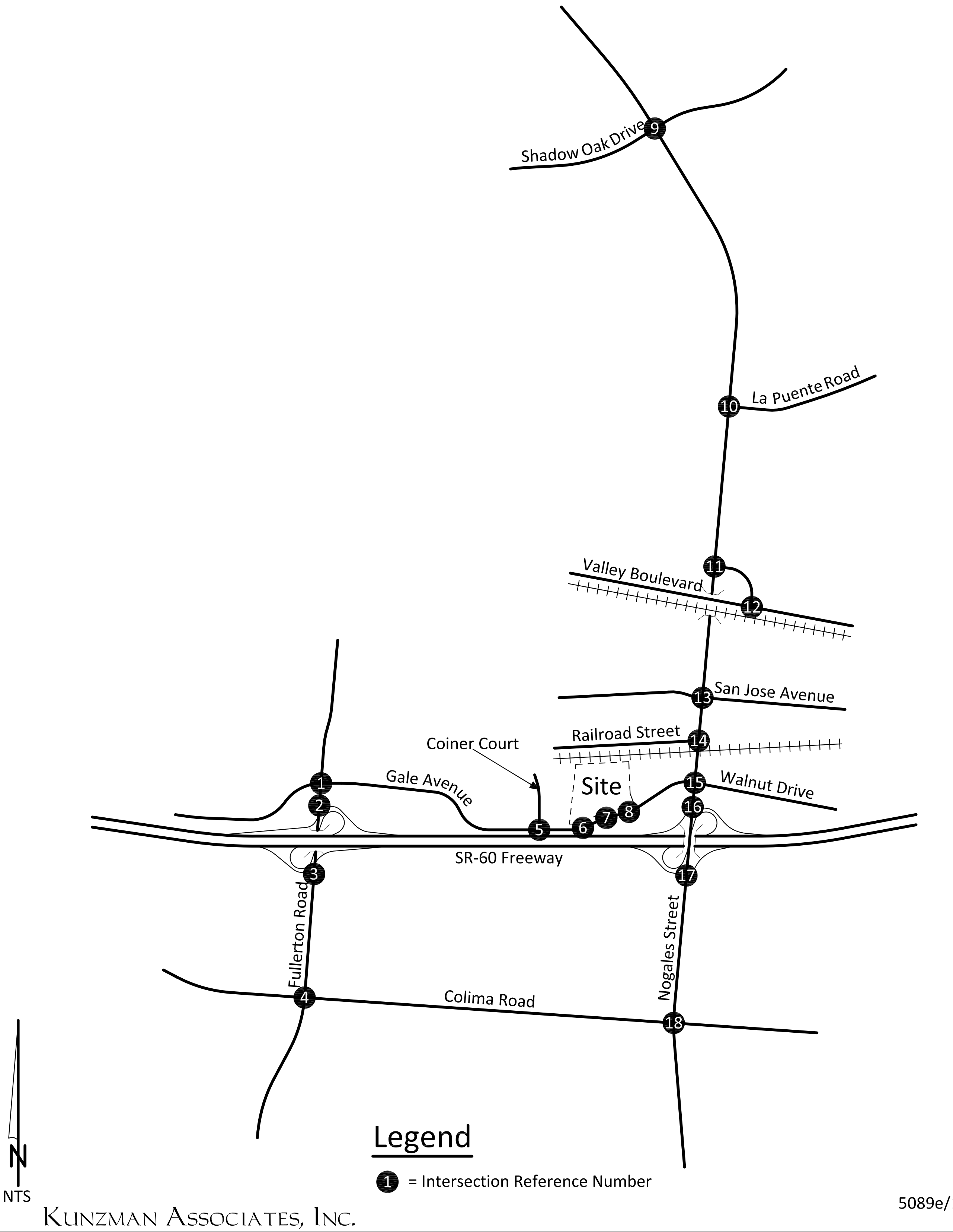

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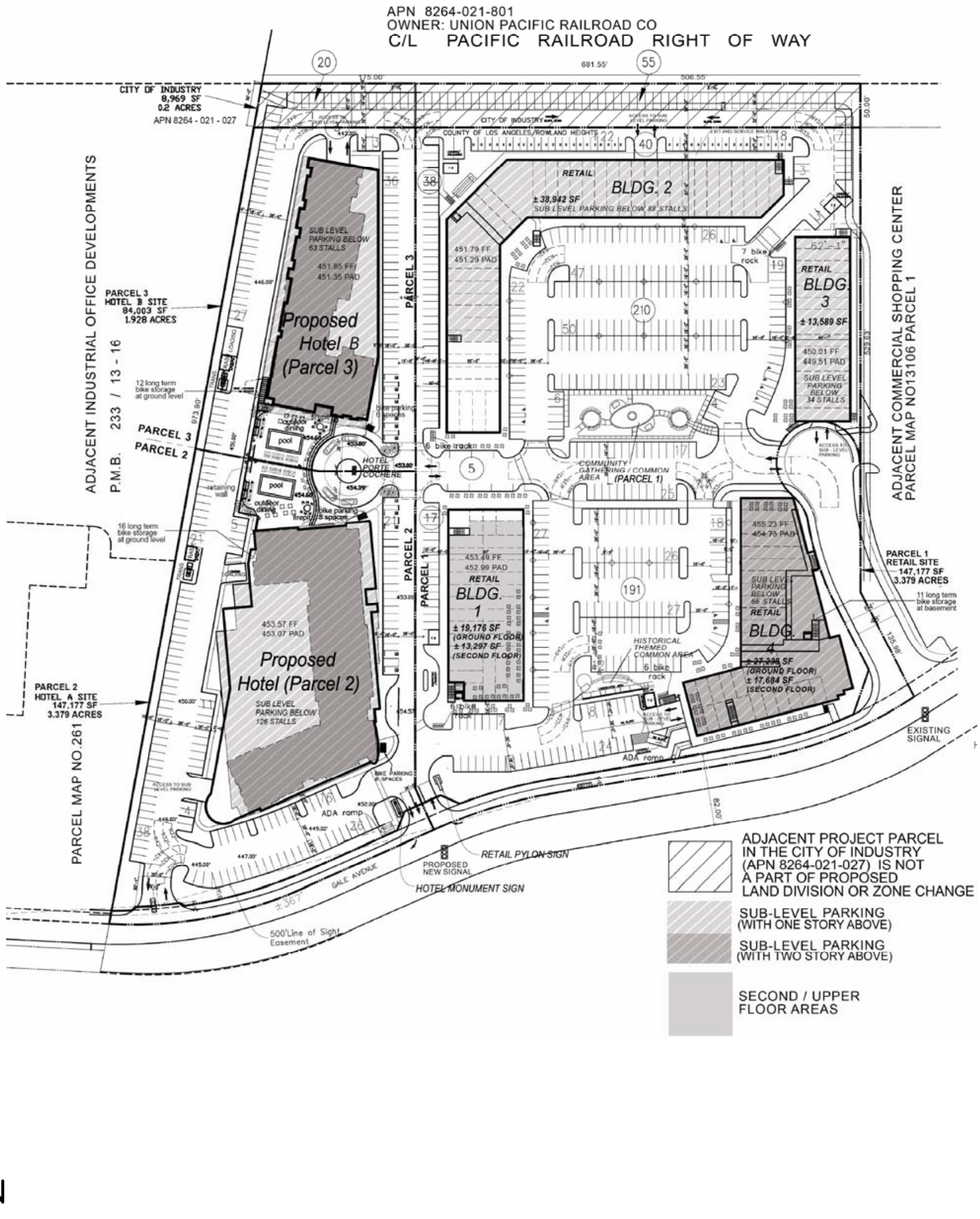
Figure 2
Site Plan



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IV. Existing Traffic Conditions

The traffic conditions as they exist today are discussed below and illustrated on Figures 3 to 9. Per discussions with the County of Los Angeles Department of Transportation, the intersection traffic counts were conducted before Nogales Street was temporarily closed and traffic was redistributed.

A. Surrounding Street System

Roadways that will be utilized by the development include Fullerton Road, Coiner Court, Nogales Street, Shadow Oak Drive, La Puente Road, Valley Boulevard, San Jose Avenue, Railroad Street, Gale Avenue/Walnut Drive, and Colima Road.

Fullerton Road: This north-south roadway currently is four lanes divided to five lanes divided in the study area. Fullerton Road is classified as a Major Highway (100 foot right-of-way) on the County of Los Angeles Highway Plan. It currently carries approximately 15,400 to 27,000 vehicles per day in the study area.

Coiner Court: This north-south roadway currently is two lanes undivided in the study area. Coiner Court is not classified on the County of Los Angeles Highway Plan. It currently carries approximately 2,000 vehicles per day in the study area.

Nogales Street: This north-south roadway currently is four lanes divided to six lanes divided in the study area. Nogales Street is classified as a Major Highway (100 foot right-of-way) on the County of Los Angeles Highway Plan. It currently carries approximately 16,400 to 29,600 vehicles per day in the study area.

Shadow Oak Drive: This east-west roadway currently is four lanes divided in the study area. Shadow Oak Drive is not classified on the County of Los Angeles Highway Plan. It currently carries approximately 4,300 to 9,300 vehicles per day in the study area.

La Puente Road: This east-west roadway currently is four lanes undivided in the study area. La Puente Road is classified as a Secondary Highway (80 foot right-of-way) on the County of Los Angeles Highway Plan. It currently carries approximately 10,300 vehicles per day in the study area.

Valley Boulevard: This east-west roadway currently is six lanes divided in the study area. Valley Boulevard is classified as a Major Highway (100 foot right-of-way) on the County of Los Angeles Highway Plan. It currently carries approximately 19,100 to 21,500 vehicles per day in the study area.

San Jose Avenue: This east-west roadway currently is two lanes undivided to four lanes undivided in the study area. San Jose Avenue is not classified on the County of Los Angeles Highway Plan. It currently carries approximately 6,500 to 8,600 vehicles per day in the study area.

Railroad Street: This east-west roadway currently two lanes divided in the study area. Railroad Street is not classified on the County of Los Angeles Highway Plan. It currently carries approximately 1,900 vehicles per day in the study area. It should be noted that Railroad Street will no longer connect to Nogales Avenue once the Nogales undercrossing is completed.

Gale Avenue/Walnut Street: This east-west roadway currently is two lanes undivided to four lanes divided in the study area. Gale Avenue/Walnut Street is not classified on the County of Los Angeles Highway Plan. It currently carries approximately 10,900 to 19,500 vehicles per day in the study area.

Colima Road: This east-west roadway currently is five lanes divided to six lanes divided in the study area. Colima Road is classified as a Major Highway (100 foot right-of-way) on the County of Los Angeles Highway Plan. It currently carries approximately 24,800 to 26,600 vehicles per day in the study area.

B. Existing Travel Lanes and Intersection Controls

Figure 3 identifies the existing roadway conditions for study area roadways. The number of through lanes for existing roadways and the existing intersection controls are identified.

C. Existing Average Daily Traffic Volumes

Figure 4 depicts the existing average daily traffic volumes. The existing average daily traffic volumes have been obtained from the 2013 Traffic Volumes on California State Highways from the California Department of Transportation and factored from peak hour counts (see Appendix C) obtained by Kunzman Associates, Inc. using the following formula for each intersection leg:

PM Peak Hour (Approach Volume + Exit Volume) x 10 = Leg Volume.

D. Existing Levels of Service

The technique used to assess the operation of an intersection is known as Intersection Capacity Utilization, as described in Appendix D. To calculate an Intersection Capacity Utilization value, the volume of traffic using the intersection is compared with the capacity of the intersection. An Intersection Capacity Utilization value is usually expressed as a decimal. The decimal represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

The Levels of Service for the existing traffic conditions have been calculated and are shown in Table 1. Existing Levels of Service are based upon manual weekday morning peak hour, weekday evening peak hour, and Saturday mid-day peak hour intersection turning movement counts made for Kunzman Associates, Inc. in April 2013 (see Figures 5, 6, and 7). Traffic count worksheets are provided in Appendix C.

There are two peak hours in a weekday. The morning peak hour is between 7:00 AM and 9:00 AM, and the evening peak hour is between 4:00 PM and 6:00 PM. There is typically one peak hour on a Saturday between 10:00 AM and 2:00 PM. The actual peak hour within the peak period is the four consecutive 15 minute periods with the highest total volume when all movements are added together. Thus, the weekday evening peak hour at one intersection may be 4:45 PM to 5:45 PM if those four consecutive 15 minute periods have the highest combined volume.

The study area intersections currently operate within acceptable Levels of Service during the peak hours for Existing traffic conditions, except for the following study area intersection that is projected to operate at an unacceptable Level of Service during the peak hours (see Table 1):

Nogales Street (NS) at:
Gale Avenue/Walnut Drive (EW) - #15

Existing Level of Service worksheets are provided in Appendix D.

E. Existing County of Los Angeles Highway Plan

Figure 8 shows the current County of Los Angeles Highway Plan. Both existing and future roadways are included in the Highway Plan and are graphically depicted on Figure 8. This figure shows the nature and extent of arterial highways that are needed to adequately serve the ultimate development depicted by the land use element of the General Plan.

F. Transit Service

Transit service is provided by Foothill Transit Routes 178, 289, 482, and 493 along Shadow Oak Drive, Nogales Street, La Puente Road, Valley Boulevard, SR-60 Freeway, and Colima Road. Figure 9 depicts the Foothill Transit System Map for the Rowland Heights area.

G. Freeway Off-Ramp Vehicle Queue Analysis

A freeway off-ramp vehicle queuing analysis has been conducted for Fullerton Road (NS) at SR-60 Freeway WB off-ramp (EW), Fullerton Road (NS) at SR-60 Freeway EB off-ramp (EW), Nogales Street (NS) at SR-60 Freeway WB off-ramp (EW), and Nogales Street (NS) at SR-60 Freeway EB off-ramp (EW). The calculation has been conducted using the Highway Capacity Manual methodology. The freeway off-ramp vehicle queue is expected to be contained in the provided vehicle stacking area (see Appendix G).

H. Freeway Ramp Delay Calculations

A freeway ramp Delay methodology Level of Service analysis has been conducted for Fullerton Road (NS) at SR-60 Freeway WB ramps (EW), Fullerton Road (NS) at SR-60 Freeway EB ramps (EW), Nogales Street (NS) at SR-60 Freeway WB ramps (EW), and Nogales Street (NS) at SR-60 Freeway EB ramps (EW). The calculation has been conducted using the Highway Capacity Manual methodology. The freeway ramp intersections are expected to operate within acceptable Levels of Service without and improvements (see Appendix H).

Table 1

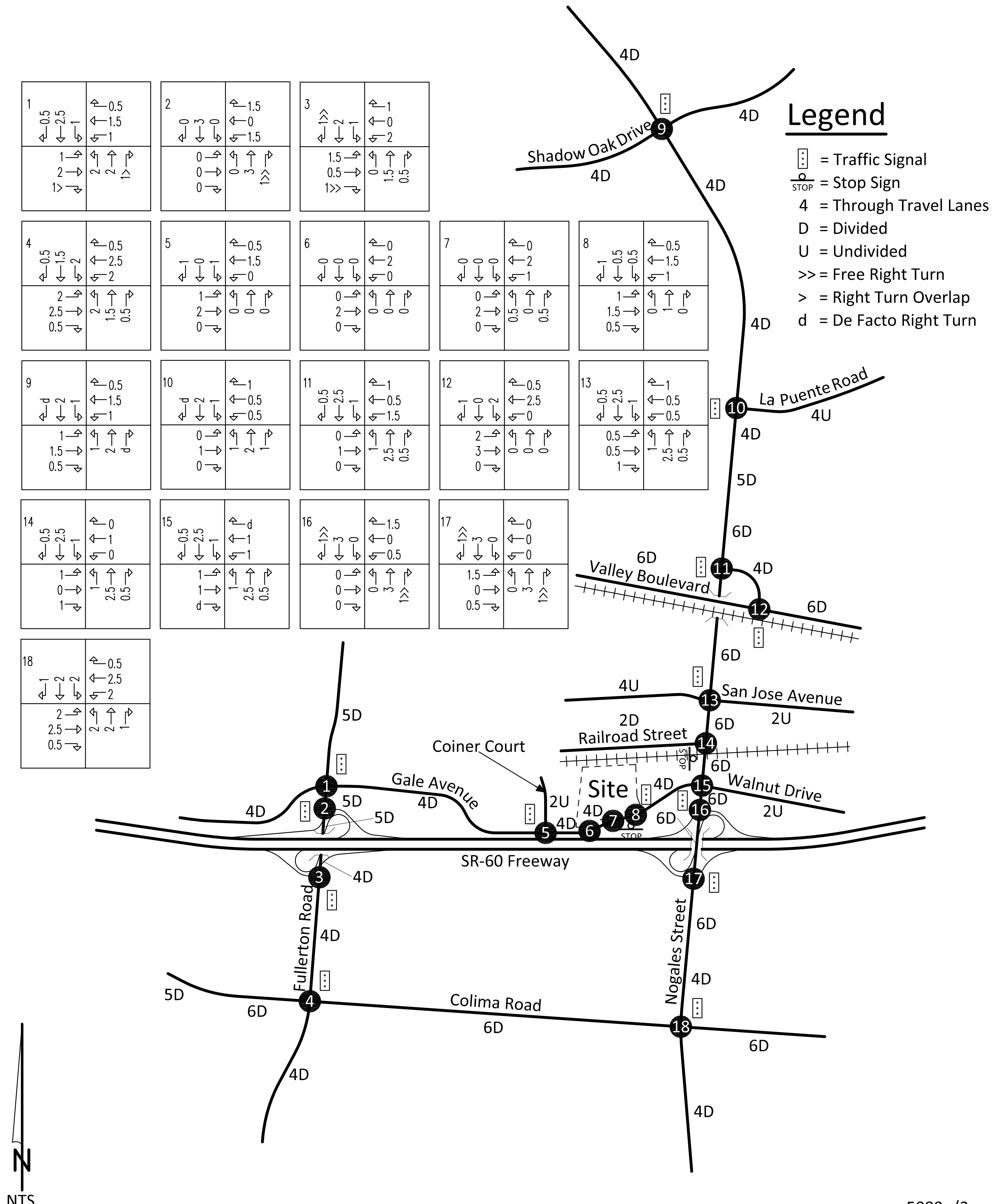
Existing Intersection Capacity Utilization and Level of Service

			Intersection Approach Lanes[1]												Peak Hour Level Of Service		
		Traffic	Northbound			Southbound			Eastbound			Westbound			Weekday		Saturday
Intersection	Jurisdiction	Control[2]	L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening	Mid-day
Fullerton Road (NS) at:																	
Gale Avenue (EW) - #1	City of Industry	TS	2	2	1>	1	2.5	0.5	1	2	1>	1	1.5	0.5	0.657-B	0.649-B	0.792-C
SR-60 Freeway WB Ramps (EW) - #2	Caltrans																
	Intersection Capacity Utilization	TS	0	3	1>>	0	3	0	0	0	0	1.5	0	1.5	0.537-A	0.471-A	0.566-A
	Highway Capacity Manual	TS	0	3	1>>	0	3	0	0	0	0	1.5	0	1.5	20.3-C	17.5-B	20.4-C
SR-60 Freeway EB Ramps (EW) - #3	Caltrans																
	Intersection Capacity Utilization	TS	0	1.5	0.5	1	2	1>>	1.5	0.5	1>>	2	0	1	0.663-B	0.657-B	0.847-D
	Highway Capacity Manual	TS	0	1.5	0.5	1	2	1>>	1.5	0.5	1>>	2	0	1	17.6-B	13.4-B	21.8-C
Colima Road (EW) - #4	County of Los Angeles	TS	2	1.5	0.5	2	1.5	0.5	2	2.5	0.5	2	2.5	0.5	0.773-C	0.825-D	0.841-D
Coiner Court (NS) at:																	
Gale Avenue (EW) - #5	City of Industry	TS	0	0	0	1	0	1	1	2	0	0	1.5	0.5	0.336-A	0.427-A	0.329-A
Project Central Access (NS) at:																	
Gale Avenue (EW) - #7	County of Los Angeles	CSS	0.5	0	0.5	0	0	0	0	2	0	1	2	0	0.308-A	0.380-A	0.331-A
Project East Access (NS) at:																	
Gale Avenue (EW) - #8	County of Los Angeles	TS	0	1	0	0.5	0.5	1	1	1.5	0.5	1	1.5	0.5	0.316-A	0.411-A	0.430-A
Nogales Street (NS) at:																	
Shadow Oak Drive (EW) - #9	City of Walnut	TS	1	2	d	1	2	d	1	1.5	0.5	1	1.5	0.5	0.666-B	0.518-A	0.522-A
La Puente Road (EW) - #10	County of Los Angeles/City of West Covina	TS	1	2	1	1	2	d	0	1	0	0.5	0.5	1	0.818-D	0.774-C	0.774-C
Valley Boulevard Loop (EW) - #11	City of West Covina	TS	1	2.5	0.5	1	2.5	0.5	0	1	0	1.5	0.5	1	0.638-B	0.630-B	0.533-A
Valley Boulevard Loop (NS) at:																	
Valley Boulevard (EW) - #12	City of West Covina	TS	0	0	0	2	0	1	2	3	0	0	2.5	0.5	0.565-A	0.399-A	0.331-A
Nogales Street (NS) at:																	
San Jose Avenue (EW) - #13	County of Los Angeles/City of Industry	TS	1	2.5	0.5	1	2.5	0.5	0.5	0.5	1	0.5	0.5	1	0.641-B	0.896-D	0.569-A
Railroad Street (EW) - #14	County of Los Angeles/City of Industry	CSS	1	2.5	0.5	1	2.5	0.5	1	0	1	0	1	0	0.534-A	0.459-A	0.466-A
Gale Avenue/Walnut Drive (EW) - #15	County of Los Angeles/City of Industry	TS	1	2.5	0.5	1	2.5	0.5	1	1	d	1	1	d	0.820-D	1.125-F	1.002-F
SR-60 Freeway WB Ramps (EW) - #16	Caltrans																
	Intersection Capacity Utilization	TS	0	3	1>>	0	3	1>>	0	0	0	0.5	0	1.5	0.647-B	0.630-B	0.631-B
	Highway Capacity Manual	TS	0	3	1>>	0	3	1>>	0	0	0	0.5	0	1.5	21.8-C	25.3-C	25.4-C
SR-60 Freeway EB Ramps (EW) - #17	Caltrans																
	Intersection Capacity Utilization	TS	0	3	1>>	0	3	1>>	1.5	0	0.5	0	0	0	0.549-A	0.684-B	0.596-A
	Highway Capacity Manual	TS	0	3	1>>	0	3	1>>	1.5	0	0.5	0	0	0	28.0-C	23.8-C	27.5-C
Colima Road (EW) - #18	County of Los Angeles	TS	2	2	1	2	2	1	2	2.5	0.5	2	2.5	0.5	0.810-D	0.720-C	0.825-D

[1]When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes (de facto right turn lane). L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; 1> = Right Turn Overlap; 1>> = Free Right Turn Lane

[2]TS = Traffic Signal; CSS = Cross Street Stop

Figure 3
Existing Through Travel Lanes and Intersection Controls



5089e/3

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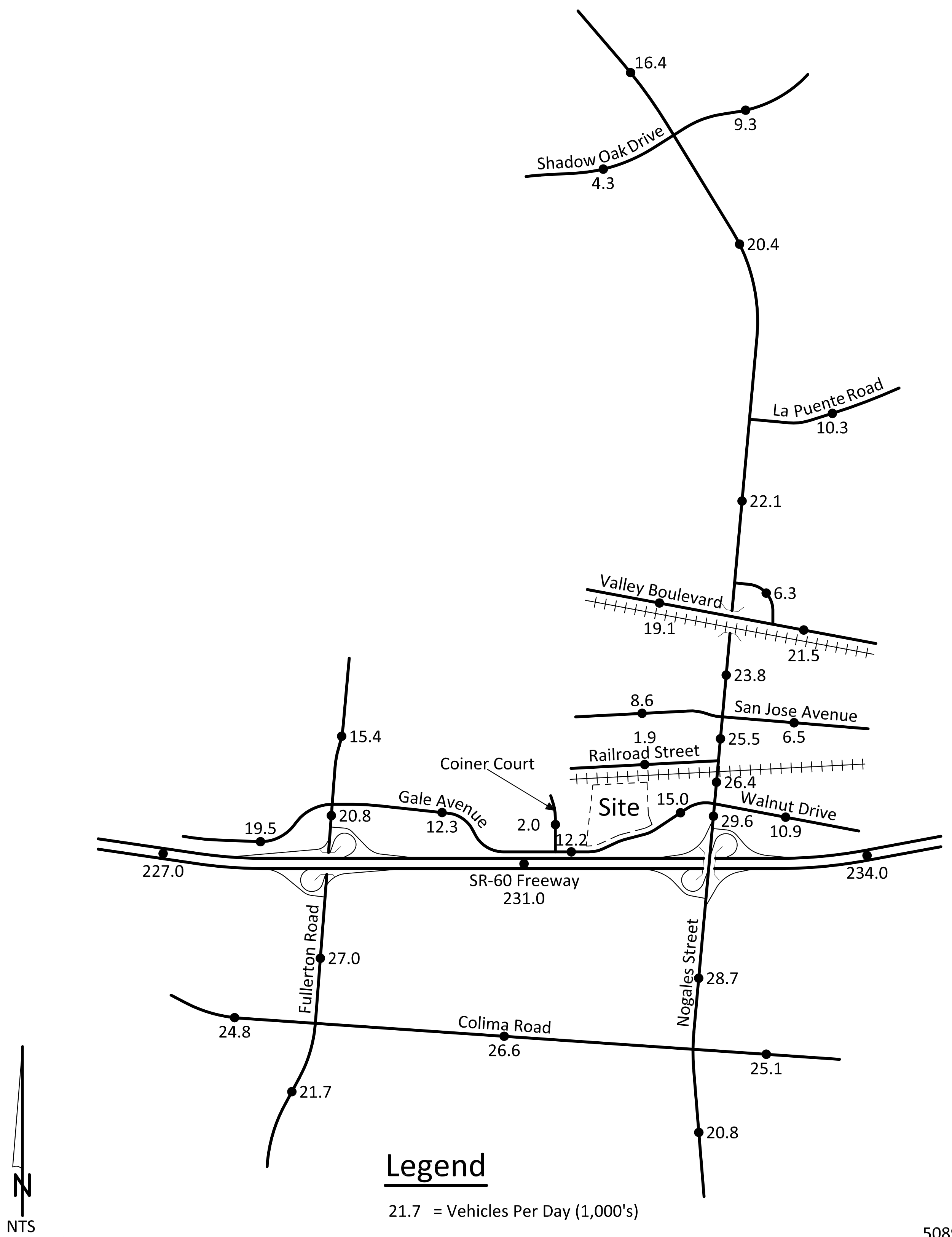
Figure 4
Existing Average Daily Traffic Volumes



Legend

21.7 = Vehicles Per Day (1,000's)

5089e/4

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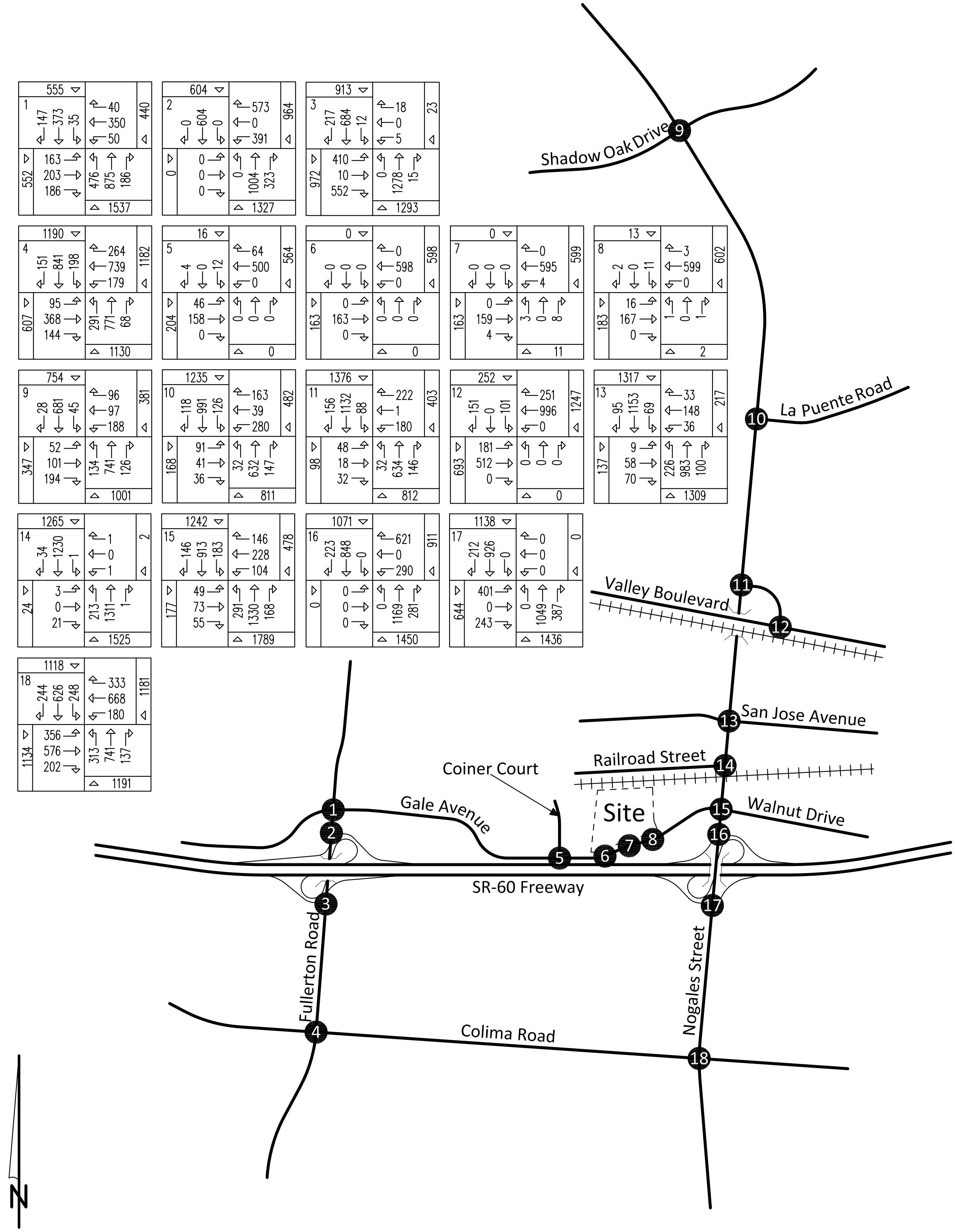
Figure 5
Existing Weekday
Morning Peak Hour Intersection Turning Movement Volumes



5089e/5

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

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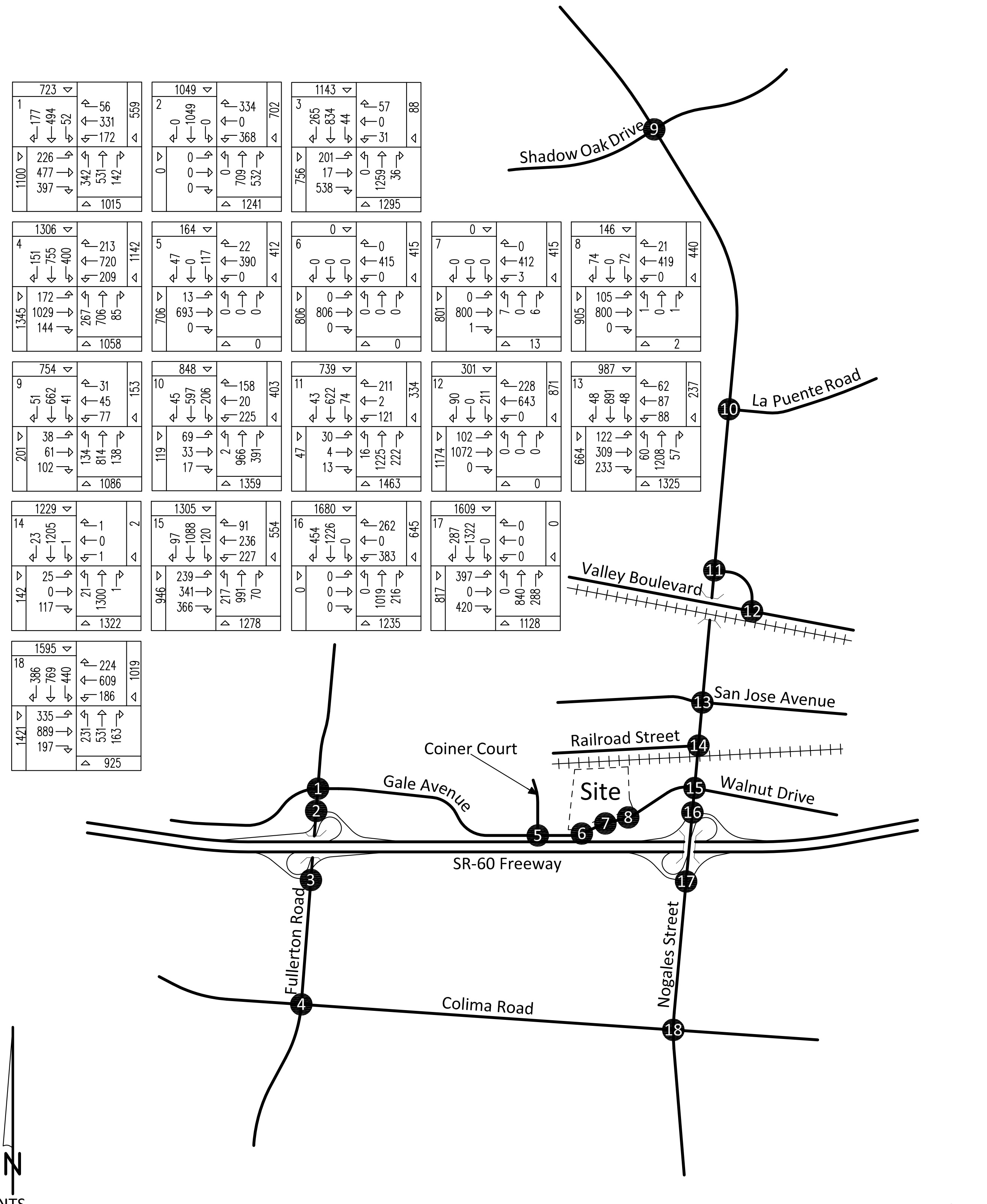
Figure 6
Existing Weekday
Evening Peak Hour Intersection Turning Movement Volumes



KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

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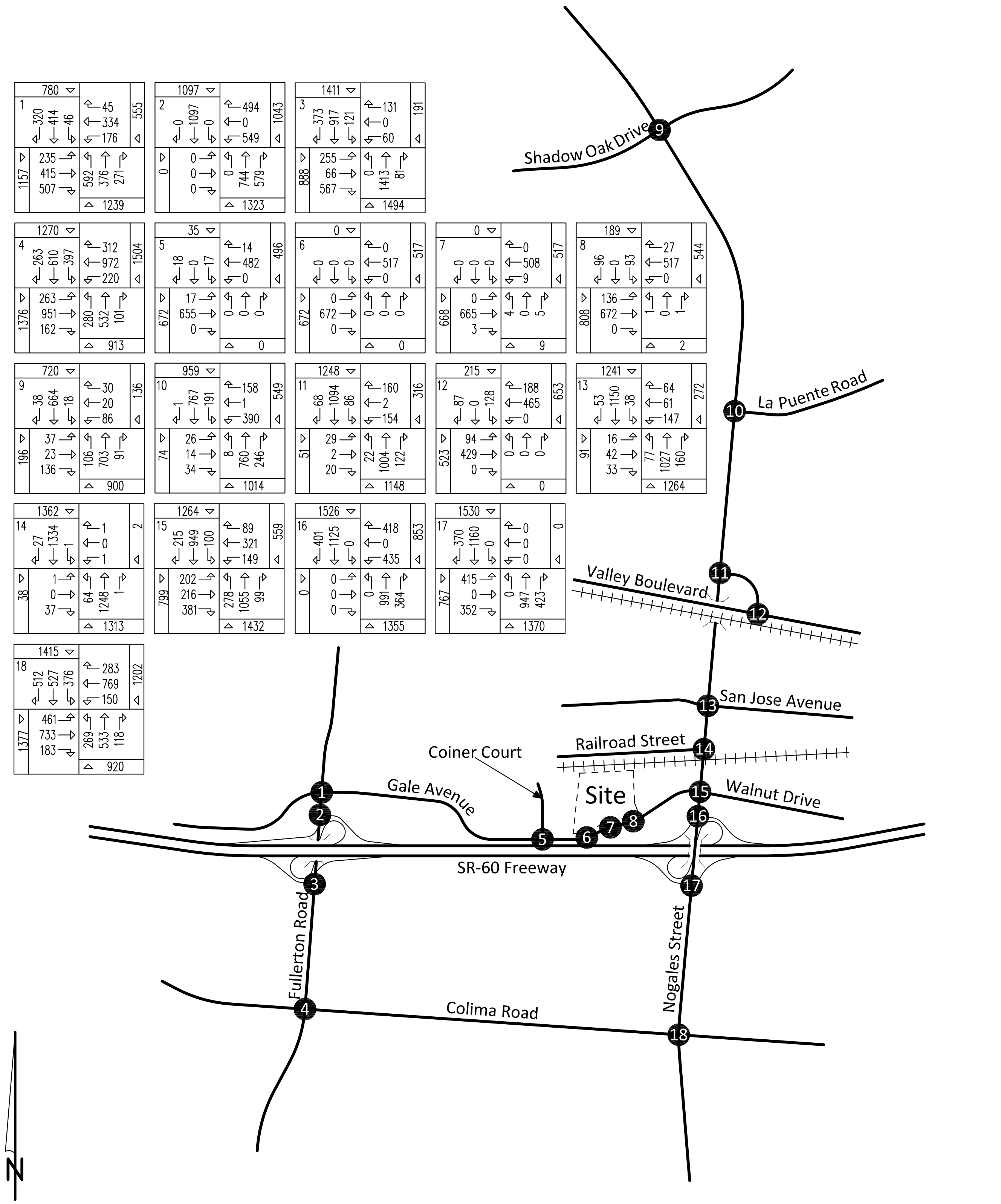
Figure 7
Existing Saturday
Mid-Day Peak Hour Intersection Turning Movement Volumes



5089e/7

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

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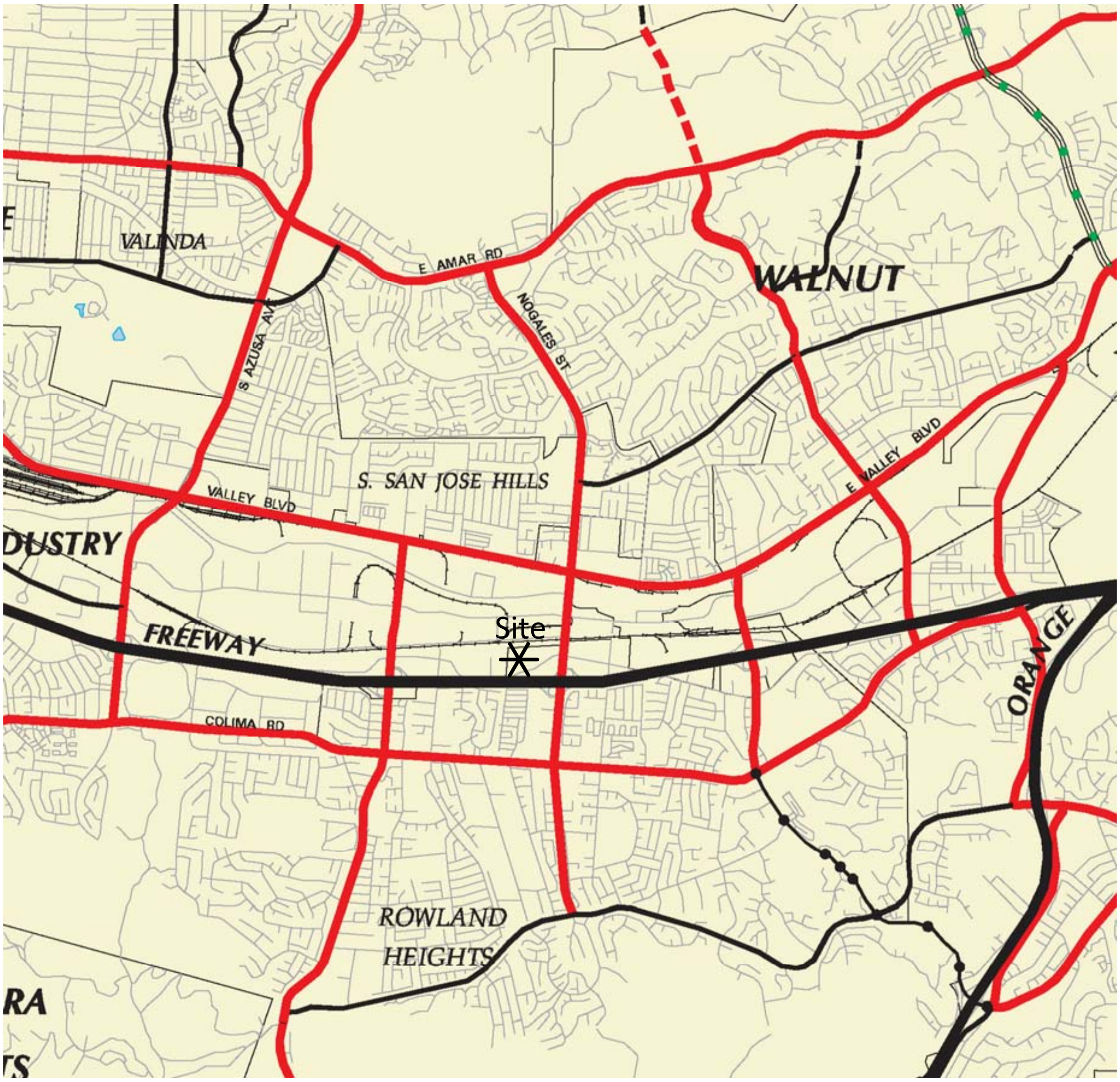
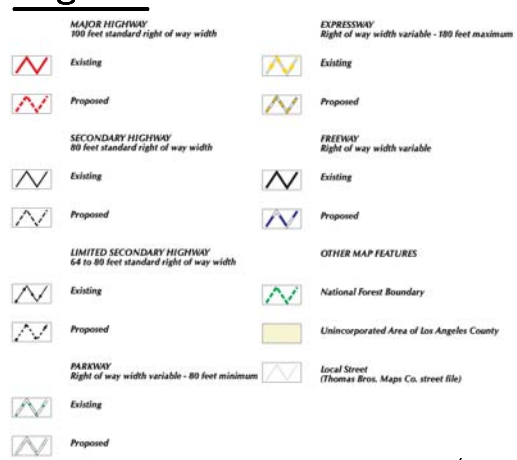
Figure 8
Los Angeles County Highway Plan



Legend



N

NTS

Source: County of Los Angeles

5089e/8

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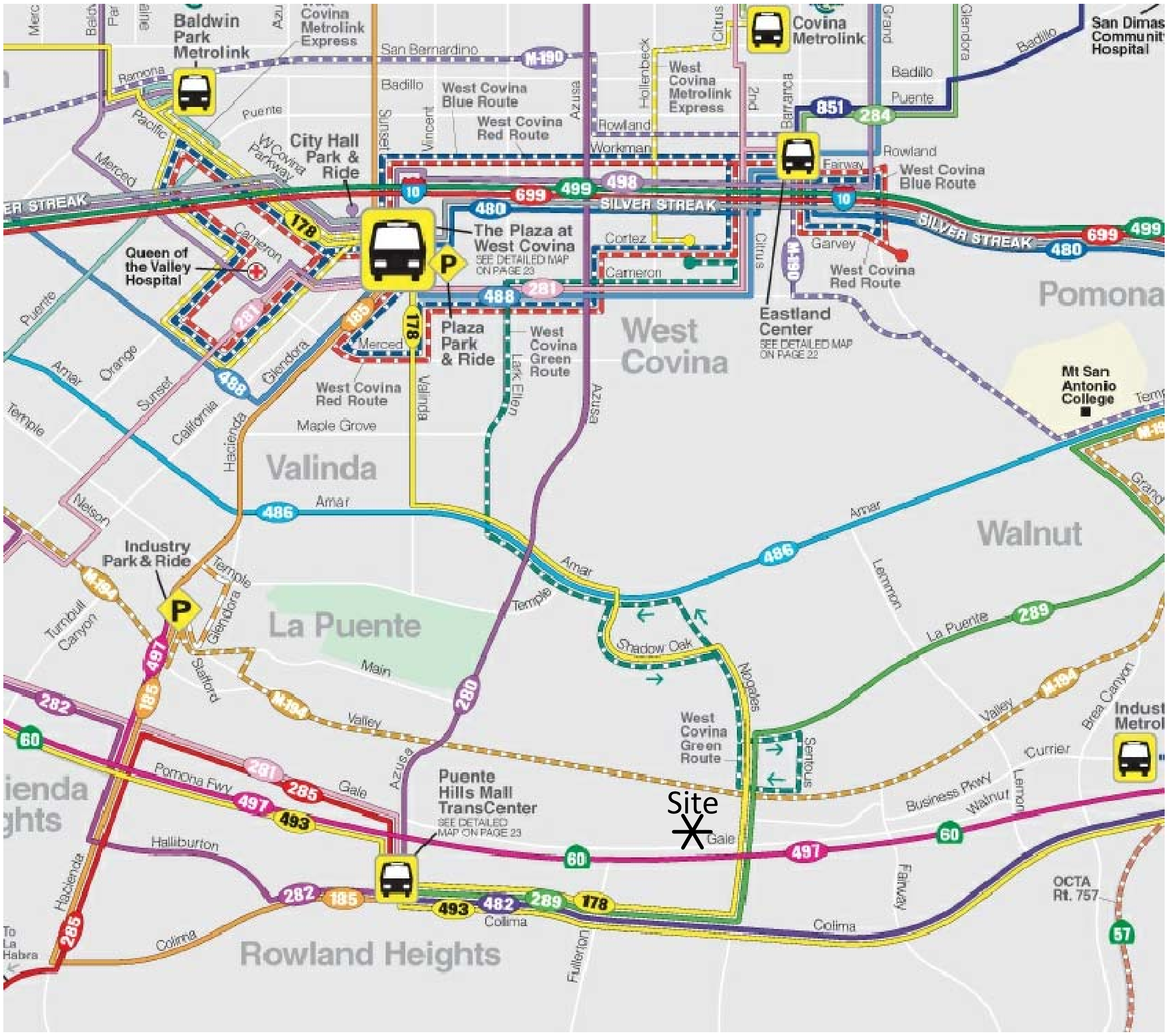
Figure 9
Foothill Transit System Map



ROUTE DESIGNATIONS

Foothill Transit lines are shown with solid route lines

Other transit lines are shown with dashed route lines

M-78 Metro routes have an "M" in the route symbol

O-62 Omitrans routes have an "O" in the route symbol

N

NTS

Source: Foothill Transit

5089e/9

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V. Project Traffic

The proposed project consists of 83,707 square feet of shopping center, 40,113 square feet of restaurant, 2,000 square feet of office, and two hotels totaling 477 rooms.

A. Trip Generation

The trips generated by the project are determined by multiplying an appropriate trip generation rate for a given land use by the square footage or other numeric indicator (seats, etc.) for the proposed land uses. Trip generation rates are predicated on the assumption that energy costs, the availability of roadway capacity, the availability of vehicles to drive, and commuting habits remain essentially unchanged during project operation. A major change in these variables may affect trip generation rates.

Project trip generation rates were determined for daily traffic, weekday morning peak hour inbound and outbound traffic, weekday evening peak hour inbound and outbound traffic, and Saturday mid-day peak hour inbound and outbound traffic for the proposed land uses. By multiplying the trip generation rates by the land use quantities, the project traffic volumes are determined. Table 2 exhibits project trip generation rates, peak hour volumes, and daily traffic volumes. The trip generation rates are from the Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012.

The proposed development is projected to generate a total of approximately 10,357 weekday daily vehicle trips, 541 vehicles per hour will occur during the weekday morning peak hour, 846 vehicles per hour will occur during the weekday evening peak hour, and 1,092 vehicles per hour will occur during the Saturday mid-day peak hour.

Pass-by trips are exemplified by vehicles accessing land uses such as a service station or fast food restaurant located along a route they are already traveling along while on route to their destination. Pass-by trips do not contribute additional traffic to the roadway network because no new trips are produced. Land uses such as service stations, fast food, and banks are often locate on major roads to attract a significant number of pass-by trips. No reductions for pass-by trips from the project were used in the analysis of the project driveways, only in the study area. The project driveways were analyzed assuming the total number of trips actually projected to be generated by the project. The pass-by trips methodology and estimation of is outlined in the Institute of Transportation Engineers, Trip Generation Handbook, Chapter 5, 2004 (see Appendix F).

B. Trip Distribution

Figures 10 to 17 contain the directional distributions of the project trips for the proposed land uses.

To determine the trip distributions for the proposed project, peak hour traffic counts of the existing directional distribution of traffic for existing areas in the vicinity of the site, and other additional information on future development and traffic impacts in the area were reviewed.

C. Trip Assignment

Based on the identified trip generation and distributions, project average daily traffic volumes have been calculated and shown on Figure 18. Weekday morning, weekday evening, and Saturday mid-day peak hour intersection turning movement volumes expected from the project are shown on Figures 19 to 21, respectively.

D. Modal Split

The traffic reducing potential of public transit has not been considered in this analysis. Accordingly, project impacts are conservatively projected, since, in actuality, that the use of public transit and the private bus fleet s can reasonably be expected to reduce project trips.

Table 2

Project Trip Generation[1]

Land Use	Quantity	Units[2]	Weekday Peak Hour Morning Inbound	Outbound	Total	Evening Inbound	Outbound	Total	Daily	Saturday Mid-day Inbound	Outbound	Total
Trip Generation Rates												
Shopping Center		TSF	0.60	0.36	0.96	1.78	1.93	3.71	42.70	2.51	2.31	4.82
High Turnover (Sit-Down) Restaurant		TSF	5.95	4.86	10.81	5.91	3.94	9.85	127.15	6.05	6.61	12.66
Quality Restaurant		TSF	0.41	0.40	0.81	5.02	2.47	7.49	89.95	6.38	4.44	10.82
Hotel		RM	0.39	0.28	0.67	0.34	0.36	0.70	8.92	0.44	0.43	0.87
Office		TSF	0.42	0.06	0.48	0.08	0.38	0.46	3.32	0.05	0.04	0.09
Trips Generated												
Shopping Center	83.707	TSF	50	30	80	149	162	311	3,574	210	193	403
High Turnover (Sit-Down) Restaurant	20.056	TSF	119	97	216	119	79	198	2,550	121	133	254
Quality Restaurant	20.057	TSF	8	8	16	101	50	151	1,804	128	89	217
Hotel	477	RM	186	134	320	162	172	334	4,255	210	205	415
Office	2.000	TSF	1	0	1	0	1	1	7	0	0	0
Subtotal			364	269	633	531	464	995	12,190	669	620	1,289
Pass-By (10%)			-36	-27	-63	-53	-46	-99	-1,219	-67	-62	-129
Commercial Internal Capture (5%)			-3	-2	-5	-7	-8	-15	-179	-11	-10	-21
Restaurant Internal Capture (10%)			-13	-11	-24	-22	-13	-35	-435	-25	-22	-47
Total			312	229	541	449	397	846	10,357	566	526	1,092

[1]Source: Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012, Land Use Categories 310, 710, 820, and 932.

[2]TSF = Thousand Square Feet; RM = Rooms

Figure 10
Project Outbound Trip Distribution - Retail

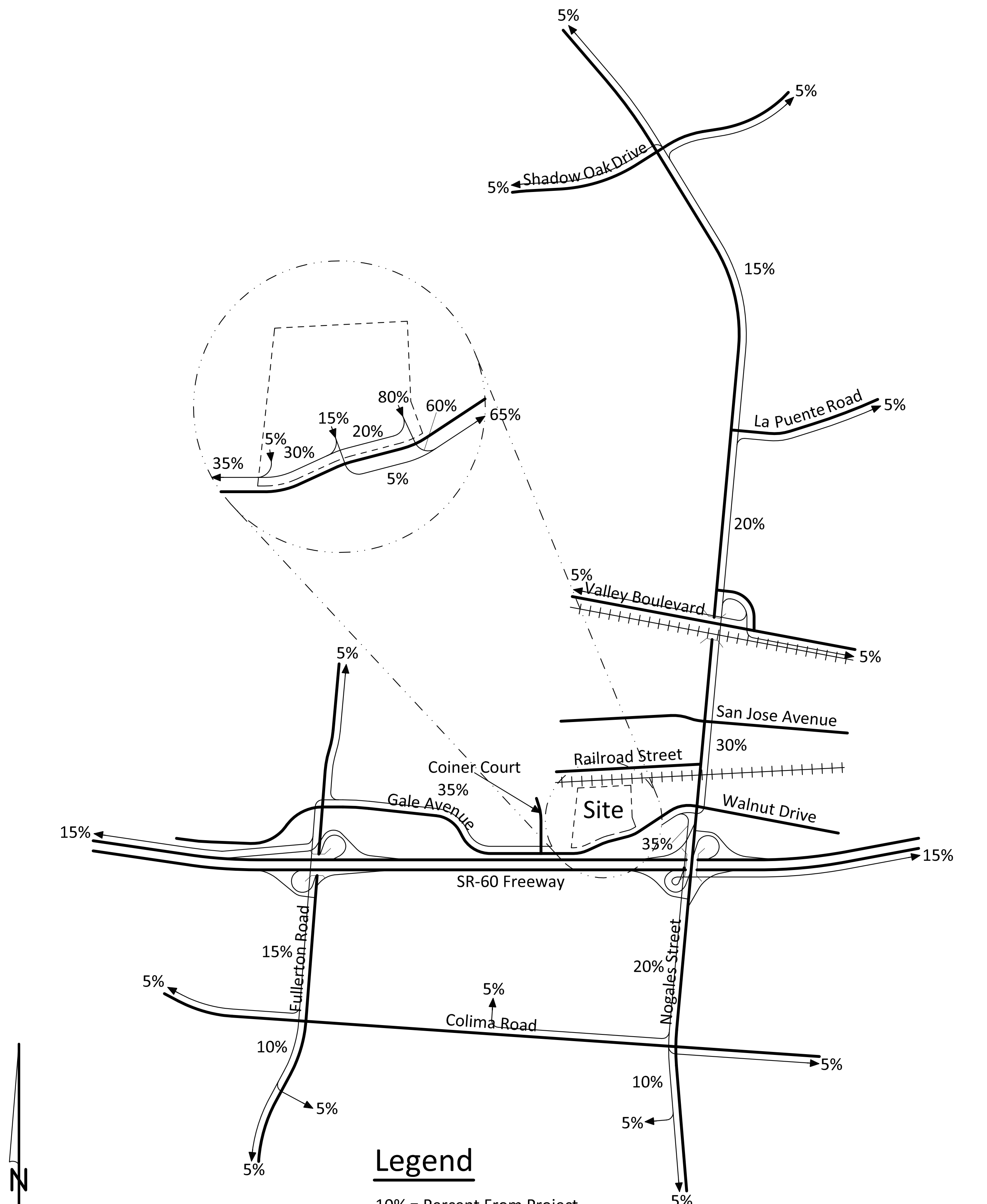

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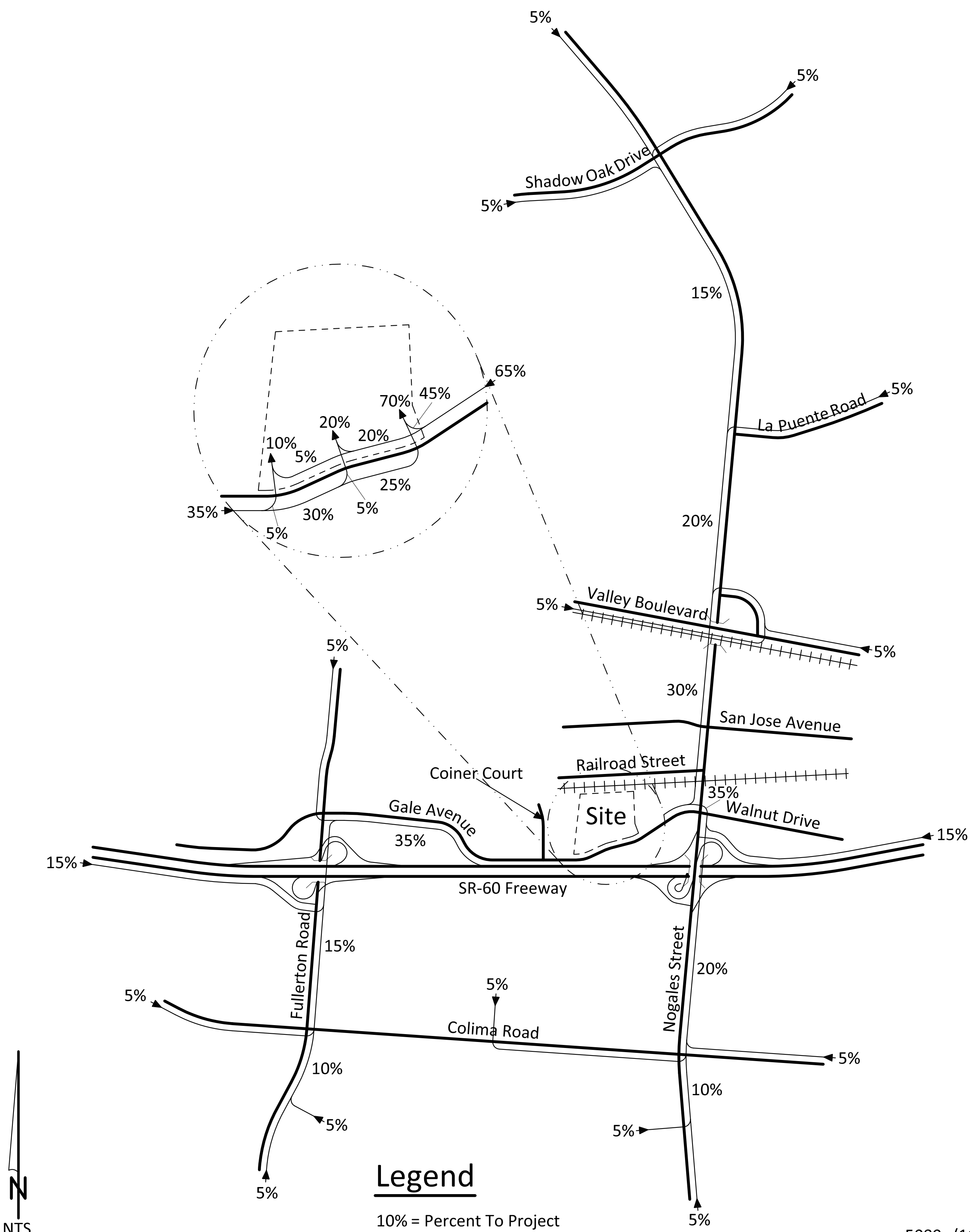
Figure 11
Project Inbound Trip Distribution - Retail



Legend

10% = Percent To Project

5089e/11

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Figure 12
Project Outbound Trip Distribution - Restaurant

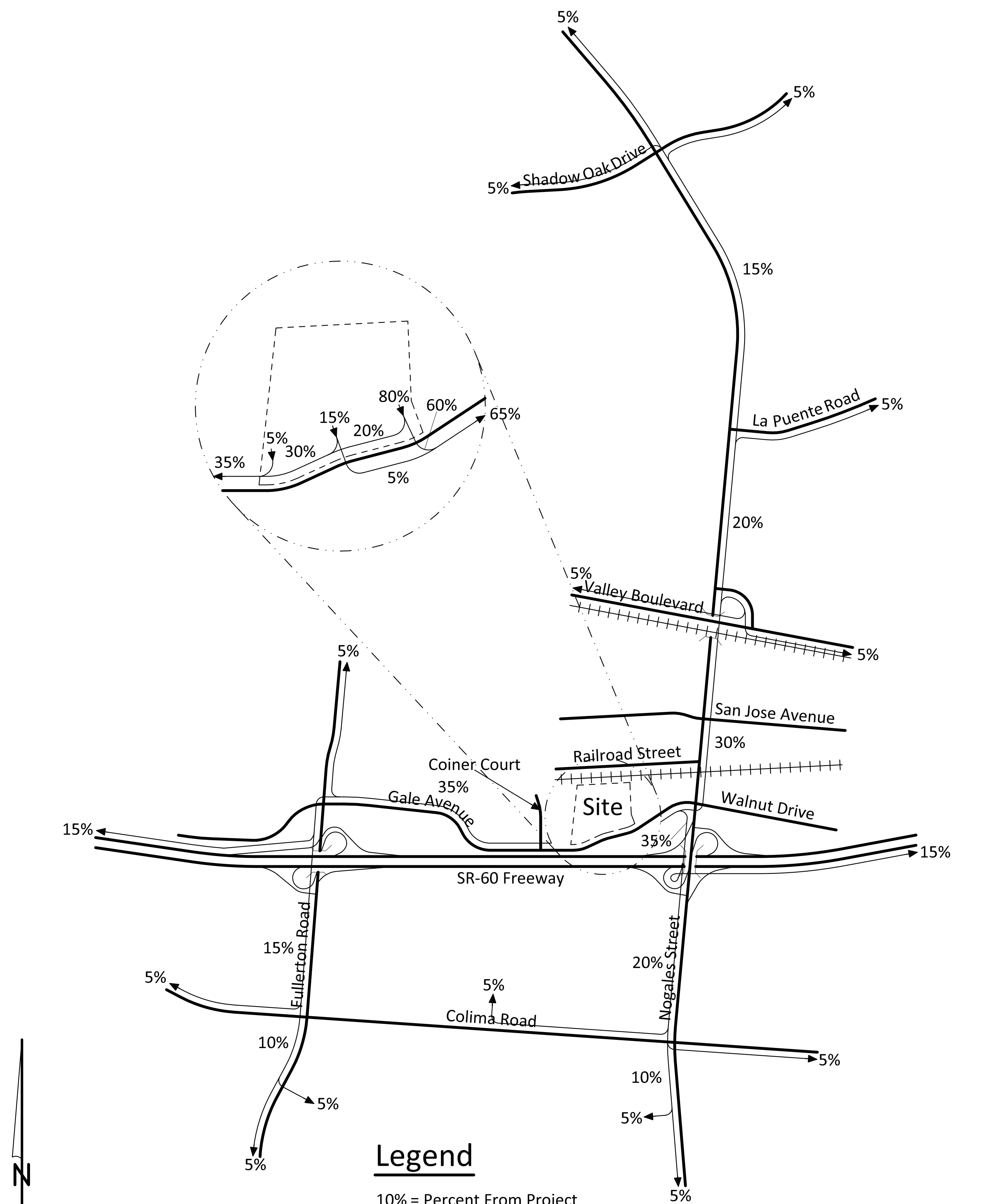

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Figure 13
Project Inbound Trip Distribution - Restaurant

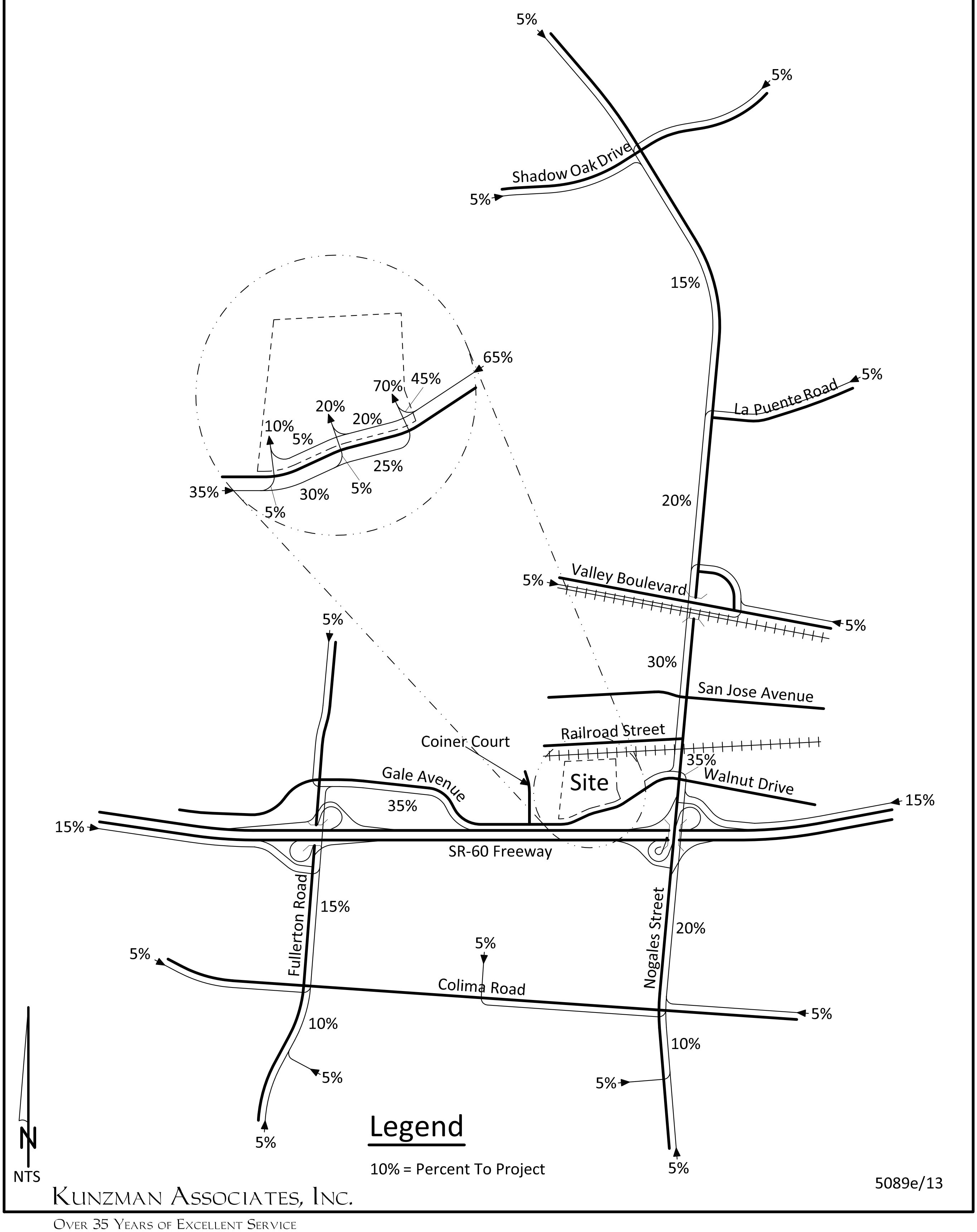

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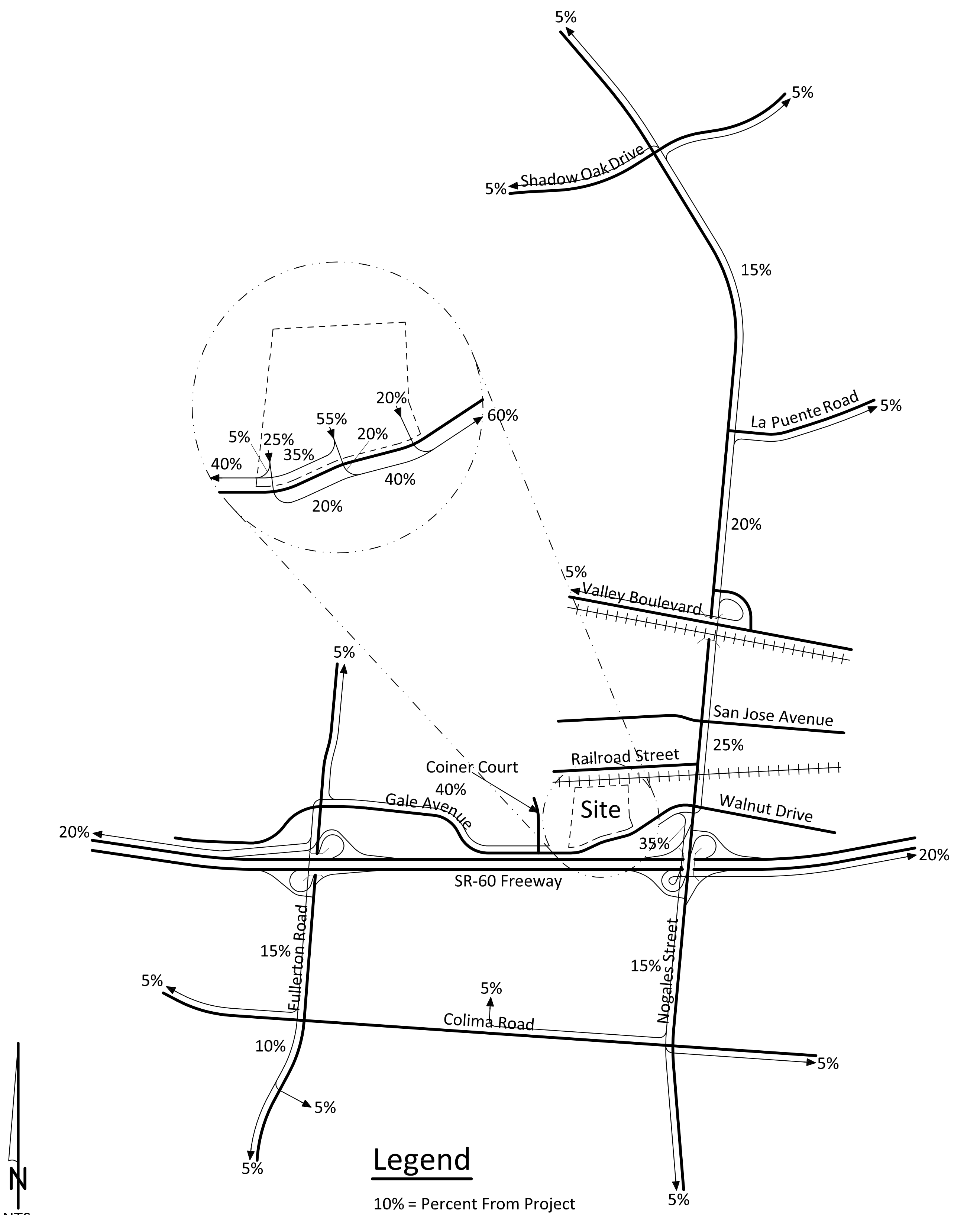
Figure 14
Project Outbound Trip Distribution - Hotel



5089e/14

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Figure 15
Project Inbound Trip Distribution - Hotel

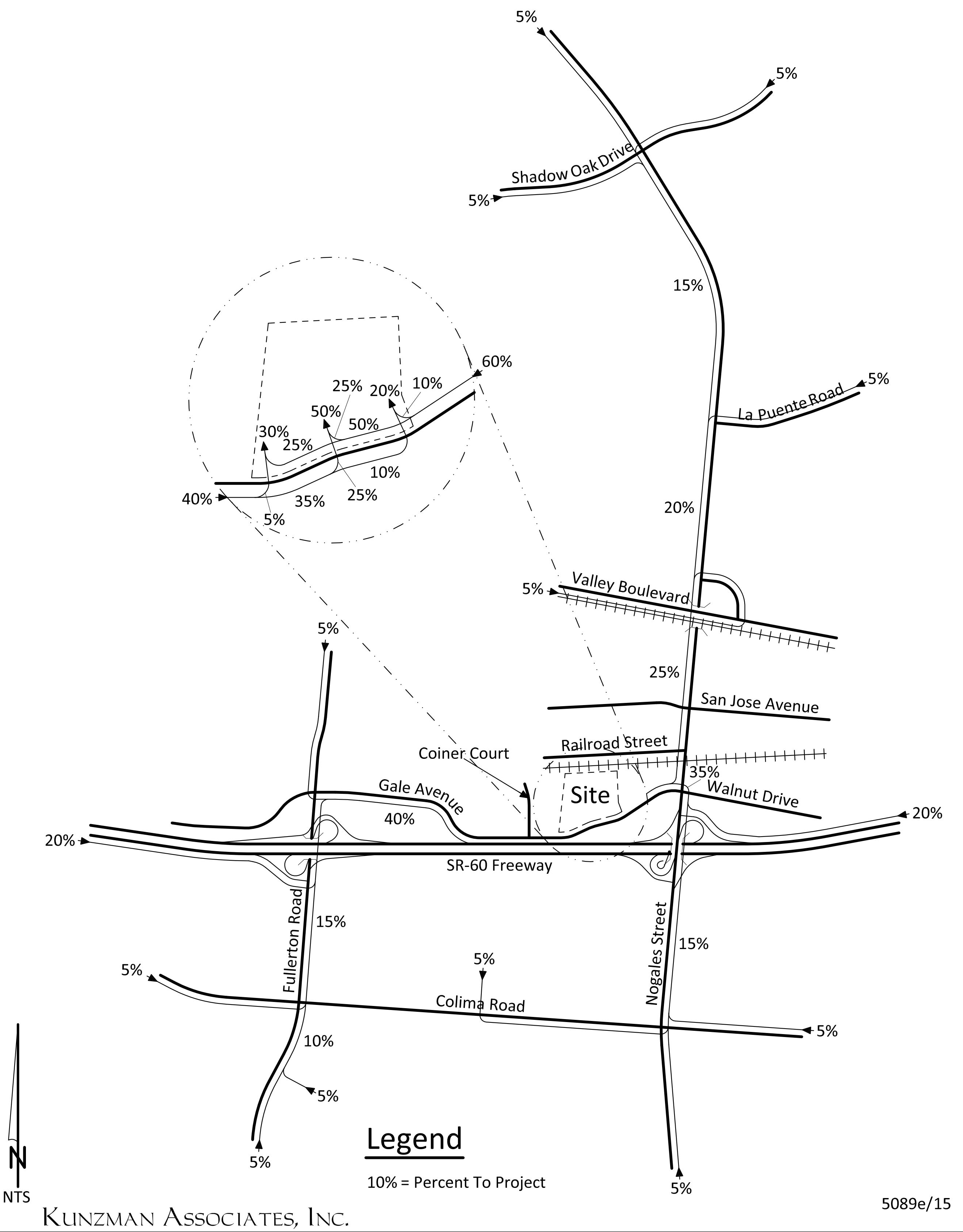

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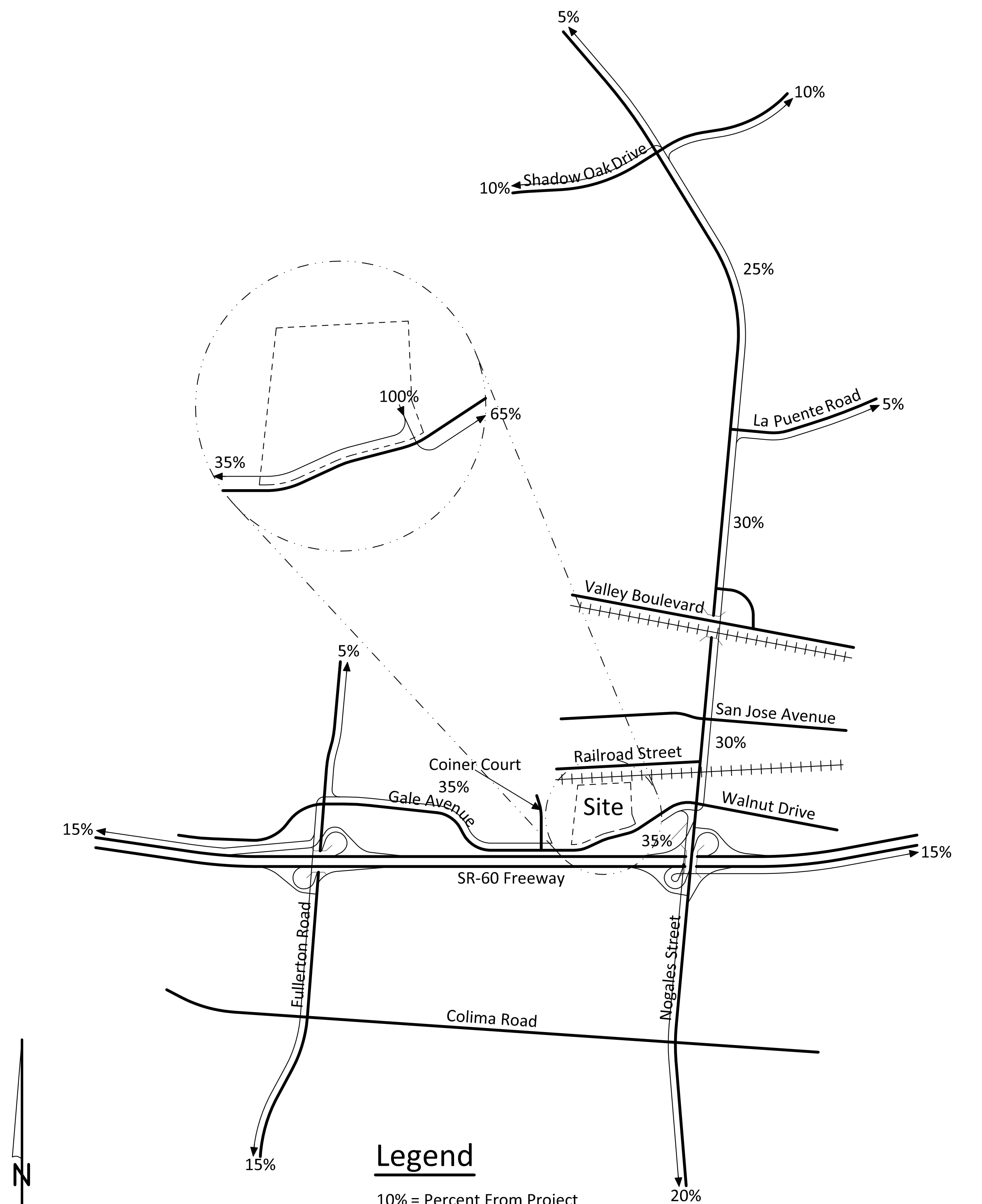
Figure 16
Project Outbound Trip Distribution - Office



Legend

10% = Percent From Project

5089e/16

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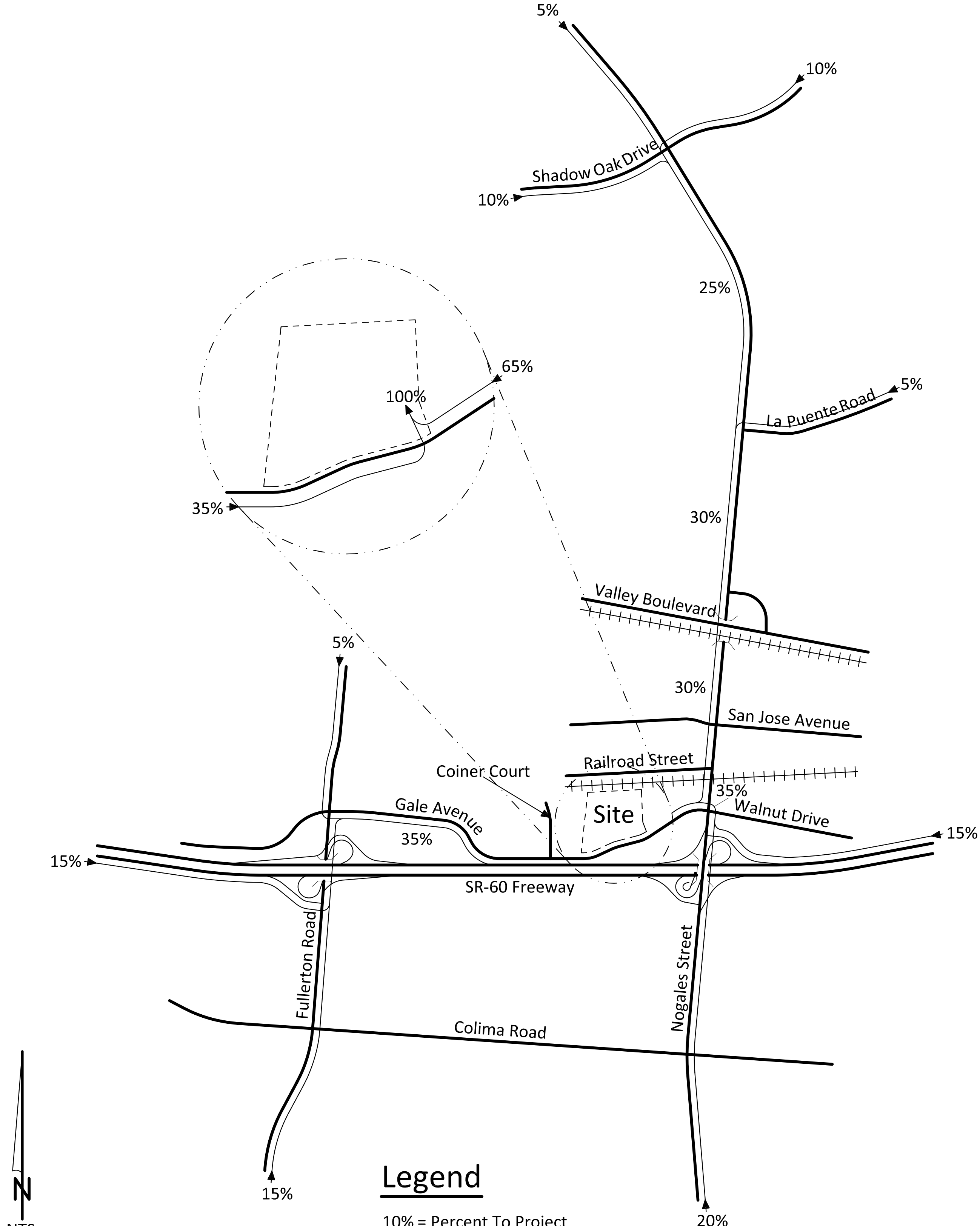
Figure 17
Project Inbound Trip Distribution - Office



5089e/17

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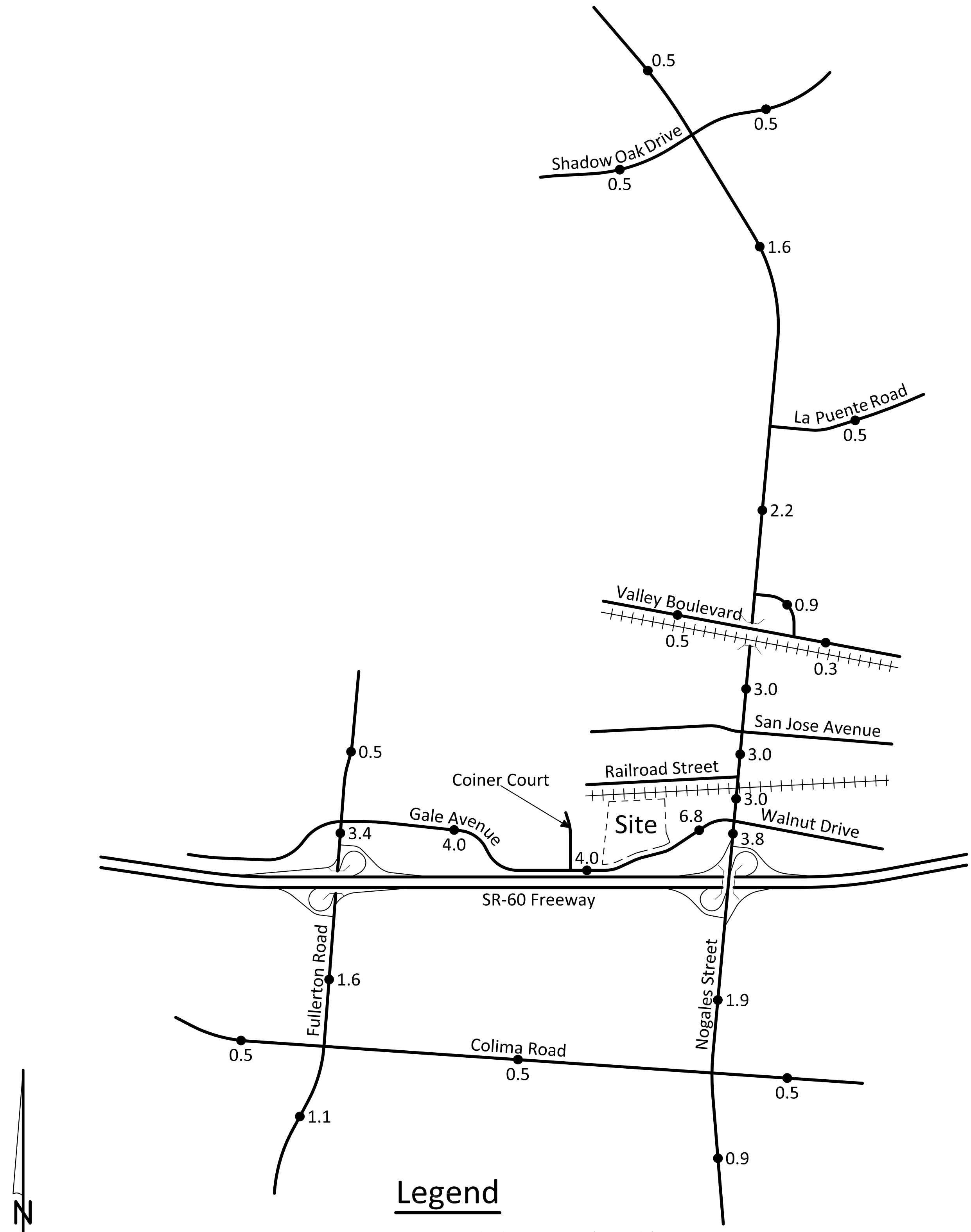
Figure 18
Project Average Daily Traffic Volumes



Legend

1.1 = Vehicles Per Day (1,000's)

5089e/18

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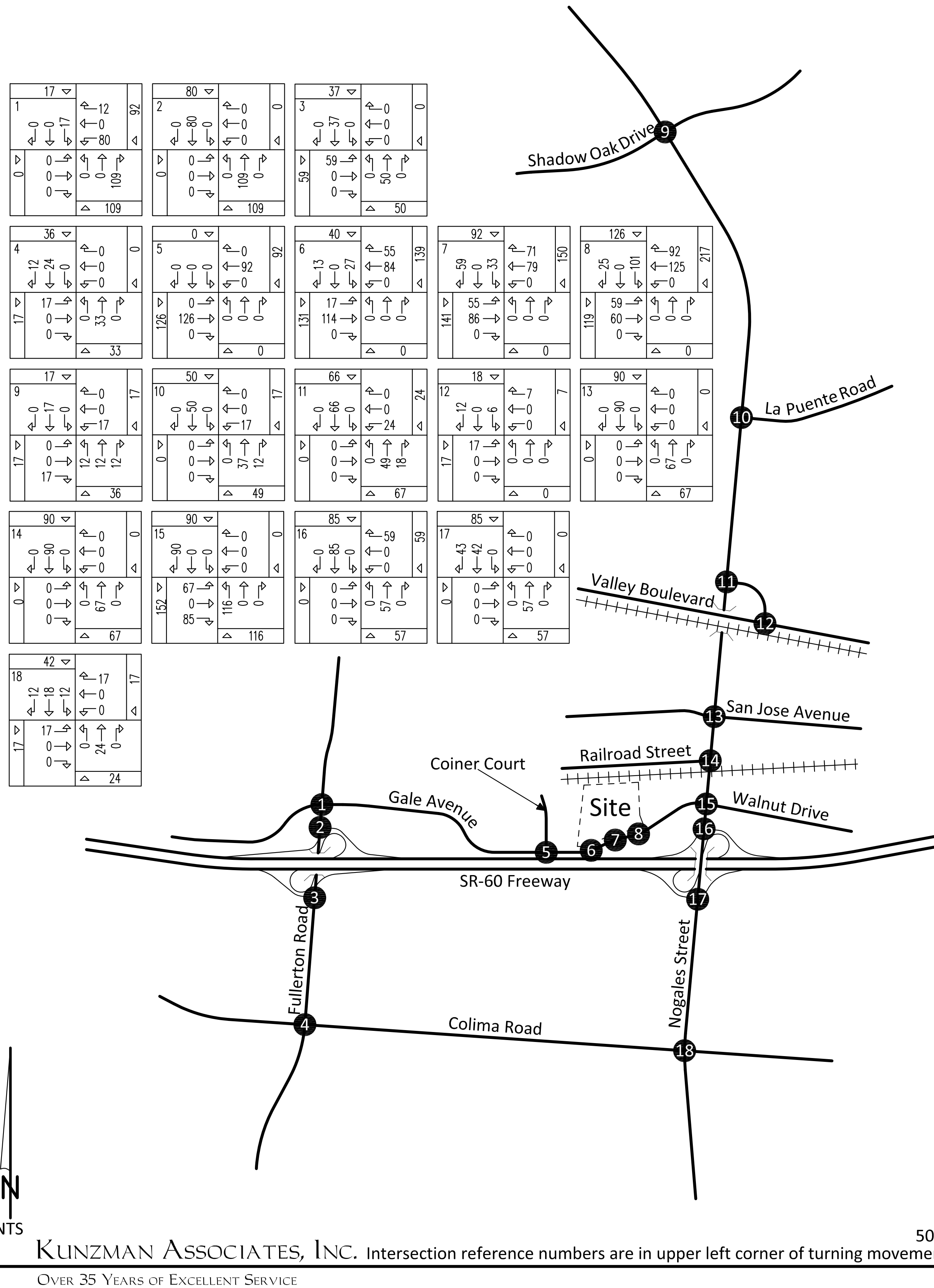
Figure 19
Project Weekday
Morning Peak Hour Intersection Turning Movement Volumes



5089e/19

Kunzman Associates, Inc. Intersection reference numbers are in upper left corner of turning movement boxes.

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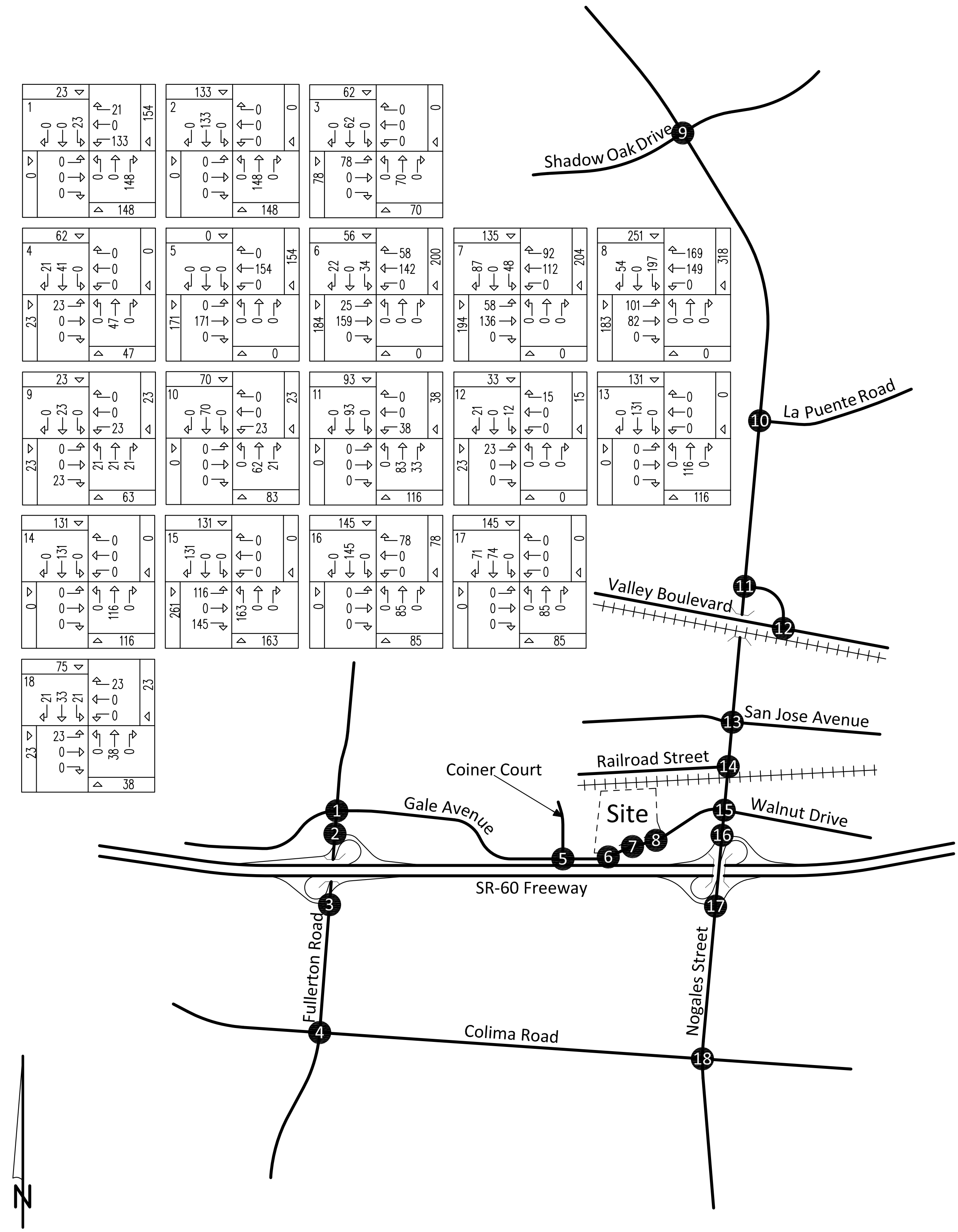
Figure 20
Project Weekday
Evening Peak Hour Intersection Turning Movement Volumes



5089e/20

Kunzman Associates, Inc. Intersection reference numbers are in upper left corner of turning movement boxes.

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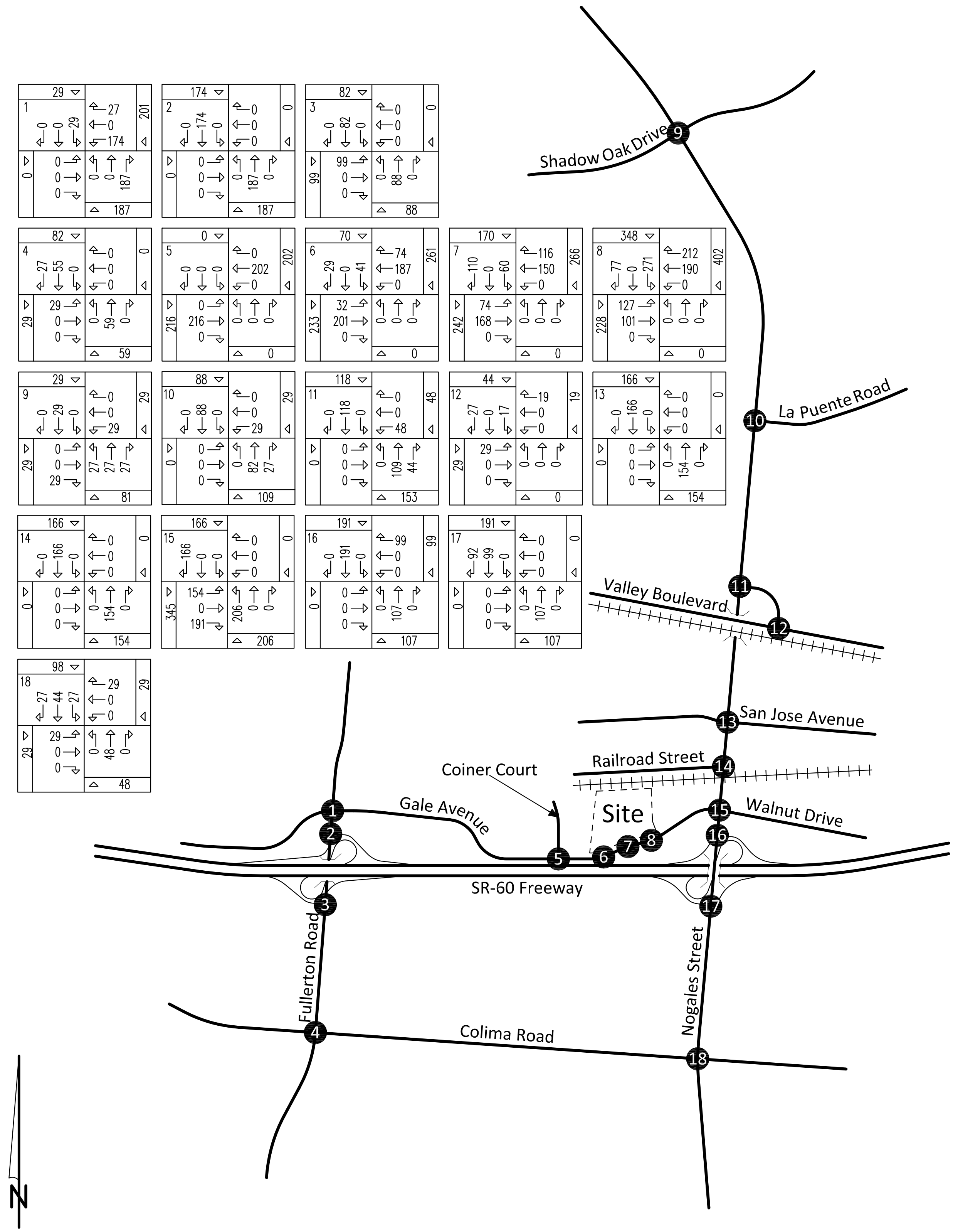
Figure 21
Project Saturday
Mid-Day Peak Hour Intersection Turning Movement Volumes



5089e/21

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

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VI. Existing Plus Project Traffic Conditions

In this section, Existing Plus Project traffic conditions are discussed. Figures 22 to 25 depict the Existing Plus Project traffic conditions. The existing plus project conditions has been analyzed to comply with the Sunnyvale West Neighborhood Association v. City of Sunnyvale CEQA court case. This scenario assumes the full development of the proposed project and full absorption of the proposed project trips on the circulation system at the present time. This scenario is provided for informational purposes only, and will not be used for impact determinations or mitigation.

A. Method of Projection

For Existing Plus Project traffic conditions, the project traffic is added to the existing traffic volumes.

B. Existing Plus Project Average Daily Traffic Volumes

Existing Plus Project average daily traffic volumes are as illustrated on Figure 22.

C. Existing Plus Project Levels of Service

The technique used to assess the operation of a signalized intersection is known as Intersection Capacity Utilization, as described in Appendix D. To calculate an Intersection Capacity Utilization value, the volume of traffic using the intersection is compared with the capacity of the intersection. An Intersection Capacity Utilization value is usually expressed as a percent. The percent represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

The Levels of Service for the Existing Plus Project traffic conditions have been calculated and are shown in Table 3. Existing Plus Project weekday morning, weekday evening, and Saturday mid-day peak hour intersection turning movement volumes are shown on Figures 23 to 25, respectively. The study area intersections are projected to operate within acceptable Levels of Service during the peak hours for Existing Plus Project traffic conditions, except for the following study area intersections that are projected to operate at an unacceptable Level of Service during the peak hours (see Table 3):

Nogales Street (NS) at:
Gale Avenue/Walnut Drive (EW) - #15

D. Existing Plus Project Traffic Signal Warrant Analysis

Traffic signals are projected to be warranted at the following study area intersections for Existing Plus Project traffic conditions (see Appendix E):

Project Central Access (NS) at:
Gale Avenue (EW) - #7

Project East Access (NS) at:
Gale Avenue (EW) - #8

The existing unsignalized intersections have been evaluated for traffic signals using the Caltrans Warrant 3 Peak Hour traffic signal warrant analysis, as specified in the California Manual of Uniform Traffic Control Devices (2014 Edition).

E. Significant Impact Evaluation

In Los Angeles County, an impact is considered significant if the project related increase in the V/C ratio equals or exceeds the thresholds shown below:

Significance Threshold for Intersections		
Level of Service	Volume/Capacity	Incremental Increase
C	0.71-0.80	0.04 or more
D	0.81-0.90	0.02 or more
E/F	0.91 - more	0.01 or more

Table 4 depicts the Existing Plus Project traffic contribution at the study area intersections. As shown in Table 4, the project could potentially significantly impact the following study area intersections under Existing Plus Project traffic conditions:

Fullerton Road (NS) at:
Gale Avenue (EW) - #1
SR-60 Freeway EB Ramps (EW) - #3
Colima Road (EW) - #4

Nogales Street (NS) at:
La Puente Road (EW) - #10
San Jose Avenue (EW) - #13
Gale Avenue/Walnut Drive (EW) - #15
Colima Road (EW) - #18

F. Freeway Off-Ramp Vehicle Queue Analysis

A freeway off-ramp vehicle queuing analysis has been conducted for Fullerton Road (NS) at SR-60 Freeway WB off-ramp (EW), Fullerton Road (NS) at SR-60 Freeway EB off-ramp (EW), Nogales Street (NS) at SR-60 Freeway WB off-ramp (EW), and Nogales Street (NS) at SR-60 Freeway EB off-ramp (EW). The calculation has been conducted using the Highway Capacity Manual methodology. The freeway off-ramp vehicle queue is expected to be contained in the provided vehicle stacking area (see Appendix G).

G. Freeway Ramp Delay Calculations

A freeway ramp Delay methodology Level of Service analysis has been conducted for Fullerton Road (NS) at SR-60 Freeway WB ramps (EW), Fullerton Road (NS) at SR-60 Freeway EB ramps (EW), Nogales Street (NS) at SR-60 Freeway WB ramps (EW), and Nogales

Street (NS) at SR-60 Freeway EB ramps (EW). The calculation has been conducted using the Highway Capacity Manual methodology. The freeway ramp intersections are expected to operate within acceptable Levels of Service without and improvements (see Appendix H).

Table 3

Existing Plus Project Intersection Capacity Utilization and Level of Service

			Intersection Approach Lanes[1]												Peak Hour Level Of Service		
		Traffic	Northbound			Southbound			Eastbound			Westbound			Weekday		Saturday
Intersection	Jurisdiction	Control[2]	L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening	Mid-day
Fullerton Road (NS) at:																	
Gale Avenue (EW) - #1	City of Industry																
- Without Improvements		TS	2	2	1>	1	2.5	0.5	1	2	1>	1	1.5	0.5	0.672-B	0.730-C	0.878-D
- With Improvements		TS	2	2	1>	1	2.5	0.5	1	2	1>	**2**	1.5	0.5	0.672-B	0.656-B	0.801-D
SR-60 Freeway WB Ramps (EW) - #2	Caltrans																
	Intersection Capacity Utilization	TS	0	3	1>>	0	3	0	0	0	0	1.5	0	1.5	0.561-A	0.499-A	0.604-B
	Highway Capacity Manual	TS	0	3	1>>	0	3	0	0	0	0	1.5	0	1.5	20.3-C	17.0-B	20.4-C
SR-60 Freeway EB Ramps (EW) - #3	Caltrans																
- Without Improvements	Intersection Capacity Utilization	TS	0	1.5	0.5	1	2	1>>	1.5	0.5	1>>	2	0	1	0.698-B	0.705-C	0.907-E
	Highway Capacity Manual	TS	0	1.5	0.5	1	2	1>>	1.5	0.5	1>>	2	0	1	18.9-B	15.4-B	24.6-C
- With Improvements	Intersection Capacity Utilization	TS	0	**2.5**	0.5	1	2	1>>	1.5	0.5	1>>	2	0	1	0.556-A	0.557-A	0.737-C
	Highway Capacity Manual	TS	0	**2.5**	0.5	1	2	1>>	1.5	0.5	1>>	2	0	1	18.7-B	15.8-B	22.8-C
Colima Road (EW) - #4	County of Los Angeles	TS	2	1.5	0.5	2	1.5	0.5	2	2.5	0.5	2	2.5	0.5	0.791-C	0.840-D	0.878-D
Coiner Court (NS) at:																	
Gale Avenue (EW) - #5	City of Industry	TS	0	0	0	1	0	1	1	2	0	0	1.5	0.5	0.368-A	0.488-A	0.401-A
Project West Access (NS) at:																	
Gale Avenue (EW) - #6	County of Los Angeles	**CSS**	0	0	0	**0.5**	0	**0.5**	**1**	2	0	0	1.5	0.5	0.380-A	0.454-A	0.433-A
Project Central Access (NS) at:																	
Gale Avenue (EW) - #7	County of Los Angeles																
- Without Improvements		CSS	0.5	0	0.5	0	0	0	0	1.5	0.5	1	2	0	0.452-A	0.532-A	0.519-A
- With Improvements		**TS**	0	1	0	0	**1**	0	**1**	1.5	0.5	1	1.5	0.5	0.452-A	0.513-A	0.517-A
Project East Access (NS) at:																	
Gale Avenue (EW) - #8	County of Los Angeles	TS	0	1	0	0.5	0.5	1	1	1.5	0.5	1	1.5	0.5	0.511-A	0.662-B	0.824-D
Nogales Street (NS) at:																	
Shadow Oak Drive (EW) - #9	City of Walnut	TS	1	2	d	1	2	d	1	1.5	0.5	1	1.5	0.5	0.702-C	0.569-A	0.585-A
La Puente Road (EW) - #10	County of Los Angeles/City of West Covina																
- Without Improvements		TS	1	2	1	1	2	d	0	1	0	0.5	0.5	1	0.848-D	0.808-D	0.819-D
- With Improvements		TS	1	2	1	1	2	d	0	1	0	**1.5**	0.5	1	0.729-C	0.738-C	0.683-B
Valley Boulevard Loop (EW) - #11	City of West Covina	TS	1	2.5	0.5	1	2.5	0.5	0	1	0	1.5	0.5	1	0.654-B	0.655-B	0.566-A
Valley Boulevard Loop (NS) at:																	
Valley Boulevard (EW) - #12	City of West Covina	TS	0	0	0	2	0	1	2	3	0	0	2.5	0.5	0.581-A	0.415-A	0.363-A
Nogales Street (NS) at:																	
San Jose Avenue (EW) - #13	County of Los Angeles/City of Industry	TS	1	2.5	0.5	1	2.5	0.5	0.5	0.5	1	0.5	0.5	1	0.661-B	0.921-E	0.606-B
Gale Avenue/Walnut Drive (EW) - #15	County of Los Angeles/City of Industry	TS	1	2.5	0.5	1	2.5	0.5	1	1	d	1	1	d	0.934-E	1.358-F	1.291-F
SR-60 Freeway WB Ramps (EW) - #16	Caltrans																
	Intersection Capacity Utilization	TS	0	3	1>>	0	3	1>>	0	0	0	0.5	0	1.5	0.679-B	0.663-B	0.699-B
	Highway Capacity Manual	TS	0	3	1>>	0	3	1>>	0	0	0	0.5	0	1.5	26.0-C	26.2-C	29.6-C
SR-60 Freeway EB Ramps (EW) - #17	Caltrans																
	Intersection Capacity Utilization	TS	0	3	1>>	0	3	1>>	1.5	0	0.5	0	0	0	0.562-A	0.701-C	0.618-B
	Highway Capacity Manual	TS	0	3	1>>	0	3	1>>	1.5	0	0.5	0	0	0	23.6-C	27.9-C	25.7-C
Colima Road (EW) - #18	County of Los Angeles																
- Without Improvements		TS	2	2	1	2	2	1	2	2.5	0.5	2	2.5	0.5	0.841-D	0.752-C	0.868-D
- With Improvements		TS	2	2	1	2	2	1	2	2.5	0.5	2	3	**1>**	0.754-C	0.740-C	0.885-D

[1]When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes (de facto right turn lane). L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; 1> = Right Turn Overlap; 1>> = Free Right Turn Lane

[2]TS = Traffic Signal; CSS = Cross Street Stop

Table 4

Existing Plus Project Significant Impact Evaluation

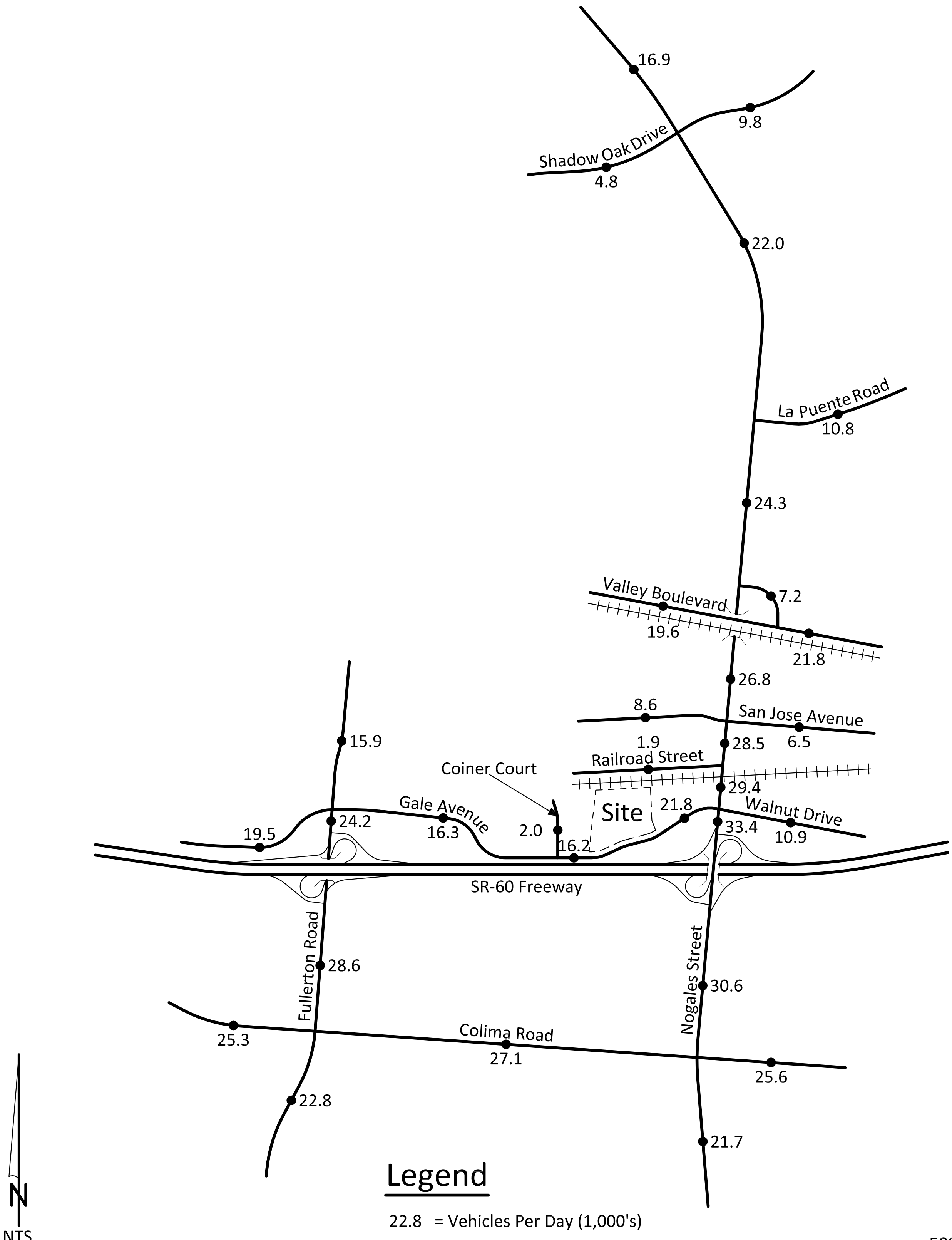
Intersection	Peak Hour	Existing		Existing Plus Project							
				Without Improvements				With Improvements			
		Intersection Capacity Utilization	Level of Service	Intersection Capacity Utilization	Level of Service	Project Impact	Significant Impact[1]	Intersection Capacity Utilization	Level of Service	Project Impact	Significant Impact[1]
Fullerton Road (NS) at:											
Gale Avenue (EW) - #1	Weekday Morning	0.657	B	0.672	B	0.015	No	0.672	B	0.015	No
	Weekday Evening	0.649	B	0.730	C	0.081	Yes	0.656	B	0.007	No
	Saturday Mid-day	0.792	C	0.878	D	0.086	Yes	0.801	D	0.009	No
SR-60 Freeway WB Ramps (EW) - #2	Weekday Morning	0.537	A	0.561	A	0.024	No				
	Weekday Evening	0.471	A	0.499	A	0.028	No				
	Saturday Mid-day	0.566	A	0.604	B	0.038	No				
SR-60 Freeway EB Ramps (EW) - #3	Weekday Morning	0.663	B	0.698	B	0.035	No	0.556	A	-0.107	No
	Weekday Evening	0.657	B	0.705	C	0.048	Yes	0.557	A	-0.100	No
	Saturday Mid-day	0.847	D	0.907	E	0.060	Yes	0.737	C	-0.110	No
Colima Road (EW) - #4[2]	Weekday Morning	0.773	C	0.791	C	0.018	No				
	Weekday Evening	0.825	D	0.840	D	0.015	No				
	Saturday Mid-day	0.841	D	0.878	D	0.037	Yes				
Coiner Court (NS) at:											
Gale Avenue (EW) - #5	Weekday Morning	0.336	A	0.368	A	0.032	No				
	Weekday Evening	0.427	A	0.488	A	0.061	No				
	Saturday Mid-day	0.329	A	0.401	A	0.072	No				
Nogales Street (NS) at:											
Shadow Oak Drive (EW) - #9	Weekday Morning	0.666	B	0.702	C	0.036	No				
	Weekday Evening	0.518	A	0.569	A	0.051	No				
	Saturday Mid-day	0.522	A	0.585	A	0.063	No				
La Puente Road (EW) - #10[2]	Weekday Morning	0.818	D	0.848	D	0.030	Yes				
	Weekday Evening	0.774	C	0.808	D	0.034	Yes				
	Saturday Mid-day	0.774	C	0.819	D	0.045	Yes				
Valley Boulevard Loop (EW) - #11	Weekday Morning	0.638	B	0.654	B	0.016	No				
	Weekday Evening	0.630	B	0.655	B	0.025	No				
	Saturday Mid-day	0.533	A	0.566	A	0.033	No				
Valley Boulevard Loop (NS) at:											
Valley Boulevard (EW) - #12	Weekday Morning	0.565	A	0.581	A	0.016	No				
	Weekday Evening	0.399	A	0.415	A	0.016	No				
	Saturday Mid-day	0.331	A	0.363	A	0.032	No				
Nogales Street (NS) at:											
San Jose Avenue (EW) - #13[2]	Weekday Morning	0.641	B	0.661	B	0.020	No				
	Weekday Evening	0.896	D	0.921	E	0.025	Yes				
	Saturday Mid-day	0.569	A	0.606	B	0.037	No				
Gale Avenue/Walnut Drive (EW) - #15[2]	Weekday Morning	0.820	D	0.934	E	0.114	Yes				
	Weekday Evening	1.125	F	1.358	F	0.233	Yes				
	Saturday Mid-day	1.002	F	1.291	F	0.289	Yes				
SR-60 Freeway WB Ramps (EW) - #16	Weekday Morning	0.647	B	0.679	B	0.032	No				
	Weekday Evening	0.630	B	0.663	B	0.033	No				
	Saturday Mid-day	0.631	B	0.699	B	0.068	No				
SR-60 Freeway EB Ramps (EW) - #17	Weekday Morning	0.549	A	0.562	A	0.013	No				
	Weekday Evening	0.684	B	0.701	C	0.017	No				
	Saturday Mid-day	0.596	A	0.618	B	0.022	No				
Colima Road (EW) - #18[2]	Weekday Morning	0.810	D	0.841	D	0.031	Yes				
	Weekday Evening	0.720	C	0.752	C	0.032	No				
	Saturday Mid-day	0.825	D	0.868	D	0.043	Yes				

[1] In Los Angeles County, an impact is considered significant if the project related increase in the volume to capacity ratio equals or exceeds the thresholds shown below:

Significant Impact Threshold for Intersections		
Level of Service	Volume/Capacity	Incremental Increase
C	0.71-0.80	0.04 or more
D	0.81-0.90	0.02 or more
E/F	0.91-more	0.01 or more

[2] Based on discussions with the County of Los Angeles, improvements at this intersection are either currently planned or infeasible.

Figure 22
Existing Plus Project Average Daily Traffic Volumes

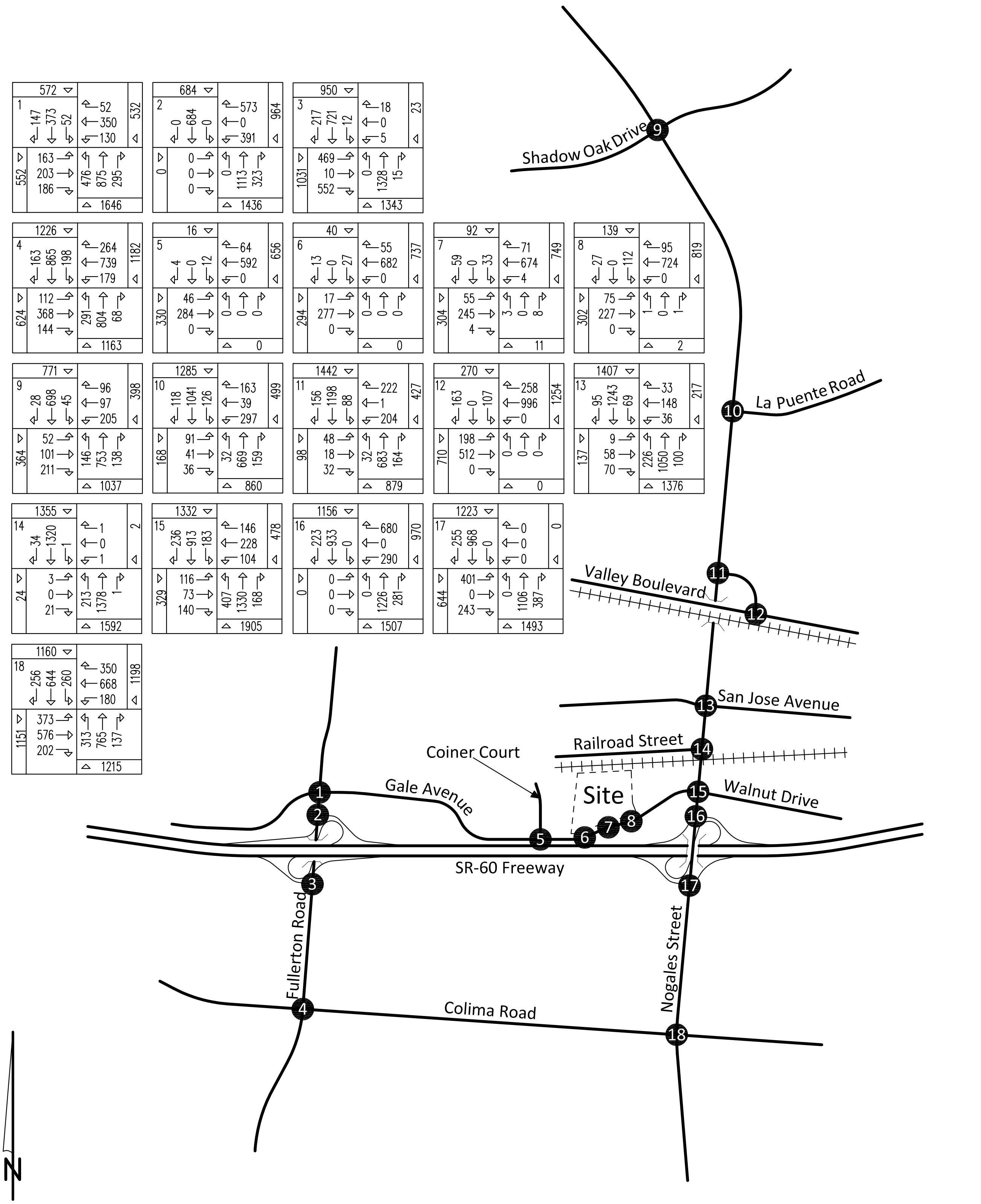


5089e/22

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 23
Existing Plus Project Weekday
Morning Peak Hour Intersection Turning Movement Volumes

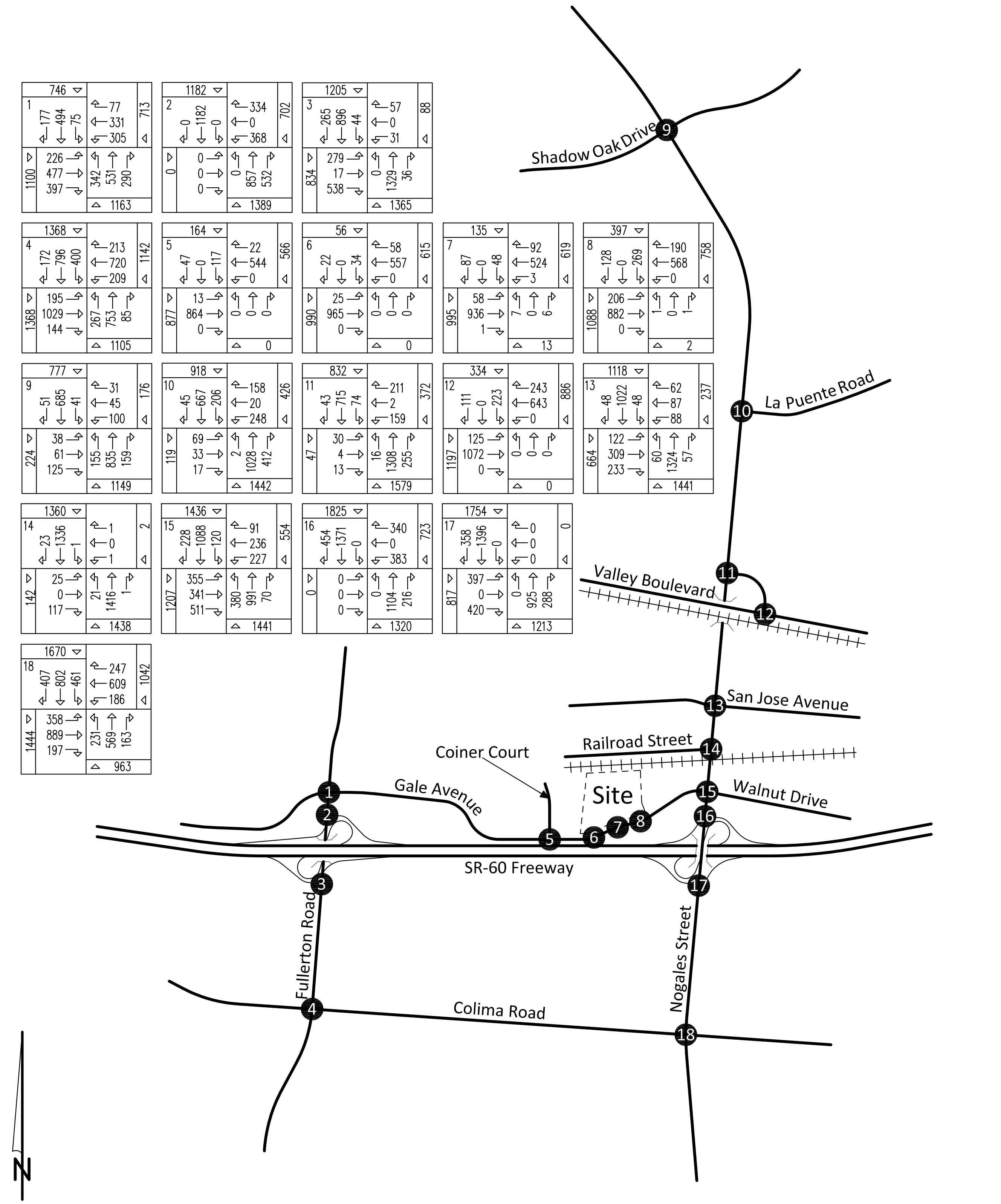


5089e/23

Kunzman Associates, Inc. Intersection reference numbers are in upper left corner of turning movement boxes.

Over 35 Years of Excellent Service

Figure 24
Existing Plus Project Weekday
Evening Peak Hour Intersection Turning Movement Volumes

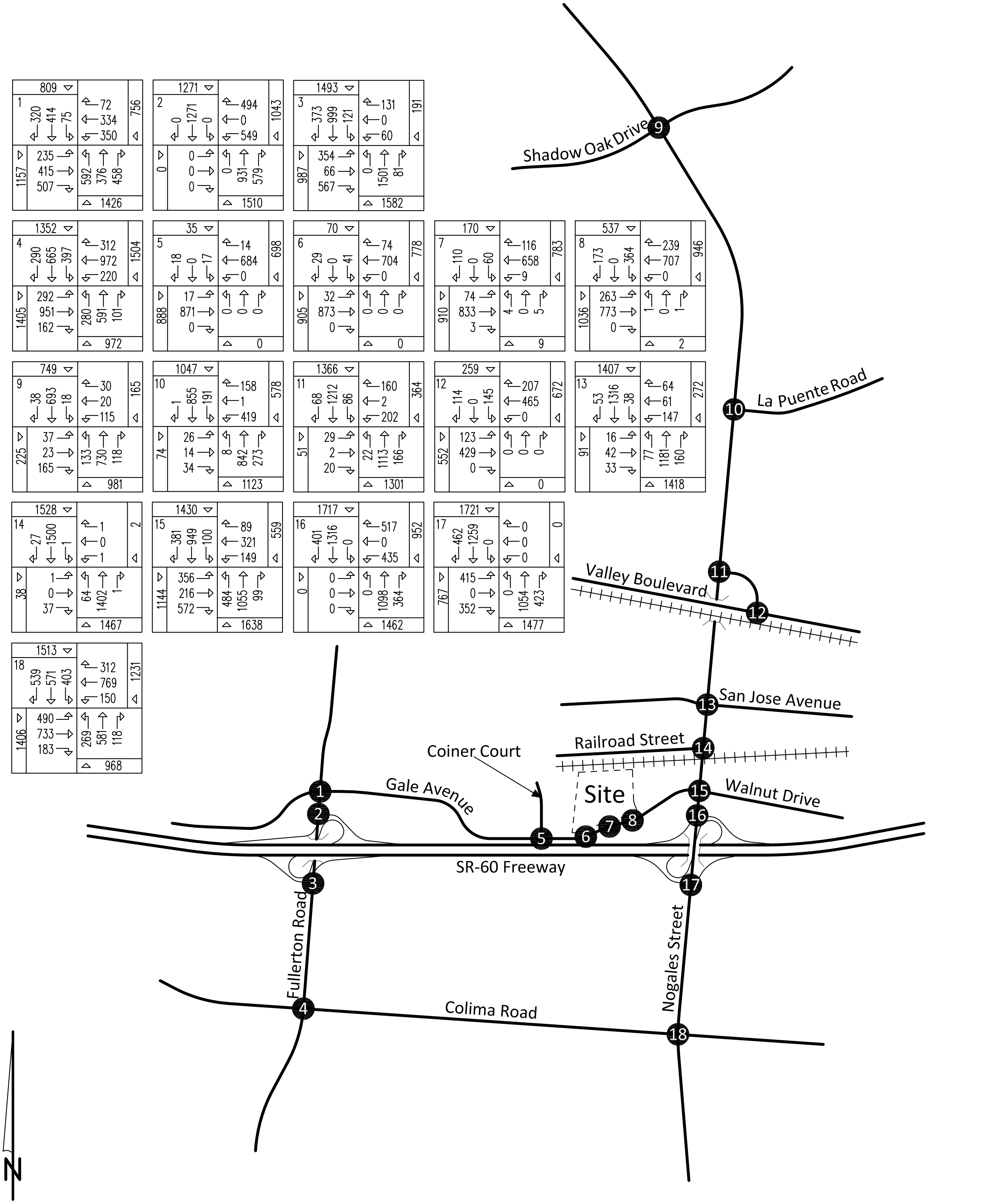


5089e/24

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 25
Existing Plus Project Saturday
Mid-Day Peak Hour Intersection Turning Movement Volumes



5089e/25

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

VII. Existing Plus Project Plus Cumulative Traffic Conditions

In this section, Existing Plus Project Plus Cumulative traffic conditions are discussed. Figures 26 to 40 depict the Existing Plus Project Plus Cumulative traffic conditions.

A. Method of Projection

To assess Existing Plus Project Plus Cumulative traffic conditions, existing traffic is combined with related projects. Table 5 lists the proposed land uses for the related projects within a 1 mile radius of the project site (see Figure 26). A list of permits filed within the past 5 years was obtained from the County of Los Angeles Department of Regional Planning and was reviewed to determine which projects could potentially add traffic to the study area intersections. This data was reviewed in May 2015. Related developments must be within 1.0 mile of the project. The Existing Plus Ambient Growth Plus Project Plus Cumulative scenario reflects cumulative conditions.

Table 5 shows the daily and peak hour vehicle trips generated by the related projects in the study area.

Figures 27 to 32 contain the directional distributions of the related projects trips for the proposed land uses. The related projects average daily traffic volumes are shown on Figure 33. Related projects weekday morning, weekday evening, and Saturday mid-day peak hour intersection turning movement volumes are shown on Figures 34 to 36, respectively.

B. Existing Plus Project Plus Cumulative Average Daily Traffic Volumes

Existing Plus Project Plus Cumulative average daily traffic volumes are as illustrated on Figure 37.

C. Existing Plus Project Plus Cumulative Levels of Service

The technique used to assess the operation of an intersection is known as Intersection Capacity Utilization, as described in Appendix D. To calculate an Intersection Capacity Utilization value, the volume of traffic using the intersection is compared with the capacity of the intersection. An Intersection Capacity Utilization value is usually expressed as a percent. The percent represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

The Levels of Service for Existing Plus Project Plus Cumulative traffic conditions have been calculated and are shown in Table 6. Existing Plus Project Plus Cumulative weekday morning, weekday evening, and Saturday mid-day peak hour intersection turning movement volumes are shown on Figures 38 to 40, respectively. The study area intersections are projected to operate within acceptable Levels of Service during the peak hours for Existing Plus Ambient Growth Plus Project Plus Cumulative traffic except for the following study area intersections that are projected to operate at an unacceptable Level of Service during the peak hours (see Table 6):

Nogales Street (NS) at:
Gale Avenue/Walnut Drive (EW) - #15

Existing Plus Project Plus Cumulative Level of Service worksheets are provided in Appendix D.

D. Significant Impact Evaluation

In Los Angeles County, an impact is considered significant if the project related increase in the V/C ratio equals or exceeds the thresholds shown below:

Significance Threshold for Intersections		
Level of Service	Volume/Capacity	Incremental Increase
C	0.71-0.80	0.04 or more
D	0.81-0.90	0.02 or more
E/F	0.91 - more	0.01 or more

Table 7 depicts the Existing Plus Project Plus Cumulative traffic contribution at the study area intersections. As shown in Table 7, the project could potentially significantly impact the following study area intersections under Existing Plus Project Cumulative traffic conditions:

Fullerton Road (NS) at:
Gale Avenue (EW) - #1
SR-60 Freeway EB Ramps (EW) - #3
Colima Road (EW) - #4

Nogales Street (NS) at:
La Puente Road (EW) - #10
San Jose Avenue (EW) - #13
Gale Avenue/Walnut Drive (EW) - #15
Colima Road (EW) - #18

E. Project Significant Impact Mitigation Measures

The following mitigation measures are required to reduce project impacts to less than significant for the corresponding intersections:

Fullerton Road (NS) at:
Gale Avenue (EW) - #1
- Construct an additional westbound left turn lane

SR-60 Freeway EB Ramps (EW) - #3
- Construct a northbound thru travel lane

Project fair share percentages are calculated in Table 8.

It should be noted that the Fullerton Road at Colima Road and Nogales Street and Colima Road intersections currently operate at acceptable Levels of Service and are projected to continue to operate at acceptable Levels of Service without or with the project.

F. Freeway Off-Ramp Vehicle Queue Analysis

A freeway off-ramp vehicle queuing analysis has been conducted for Fullerton Road (NS) at SR-60 Freeway WB off-ramp (EW), Fullerton Road (NS) at SR-60 Freeway EB off-ramp (EW), Nogales Street (NS) at SR-60 Freeway WB off-ramp (EW), and Nogales Street (NS) at SR-60 Freeway EB off-ramp (EW). The calculation has been conducted using the Highway Capacity Manual methodology. The freeway off-ramp vehicle queue is expected to be contained in the provided vehicle stacking area (see Appendix G).

G. Freeway Ramp Delay Calculations

A freeway ramp Delay methodology Level of Service analysis has been conducted for Fullerton Road (NS) at SR-60 Freeway WB ramps (EW), Fullerton Road (NS) at SR-60 Freeway EB ramps (EW), Nogales Street (NS) at SR-60 Freeway WB ramps (EW), and Nogales Street (NS) at SR-60 Freeway EB ramps (EW). The calculation has been conducted using the Highway Capacity Manual methodology. The freeway ramp intersections are expected to operate within acceptable Levels of Service without improvements (see Appendix H).

H. Freeway Mainline Analysis

A freeway mainline analysis has been conducted on the freeway segments within five (5) miles of the project site. The project is not projected to significantly impact the freeway mainline in the study area (see Appendix I).

I. Intersection Improvements Striping Overlays

Appendix J contains the striping overlays for the projected improvements.

Table 5

Other Development Trip Generation [1]

Project[2] Number	Land Use	Quantity	Units[3]	Weekday							Saturday		
				Peak Hour							Mid-day		
				Morning			Evening			Daily			
				Inbound	Outbound	Total	Inbound	Outbound	Total		Inbound	Outbound	Total
97097	Restaurant	0.828	TSF	5	4	9	5	3	8	105	6	5	116
R2012-00006	Specialty Retail	3.481	TSF	2	1	3	6	7	13	149	9	8	166
	Medical/Dental Office	2.216	TSF	1	0	1	1	2	3	20	1	1	22
	Restaurant	2.306	TSF	14	11	25	14	9	23	293	17	15	325
	Total			17	12	29	21	18	39	462	27	24	51
90242	Retail	-1.319	TSF	-1	0	-1	-2	-3	-5	-56	-3	-3	-62
	Restaurant	1.319	TSF	8	6	14	8	5	13	168	10	9	187
	Total			24	18	42	27	20	47	574	34	30	64

[1] Source: Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012, Land Use Categories 720, 820, and 932.

[2] Source: County of Los Angeles Department of Regional Planing (development data current as of May 2015). Related developments must be within 1.0 mile of the project.

[2] TSF = Thousand Square Feet

Table 6

Existing Plus Project Plus Cumulative Intersection Capacity Utilization and Level of Service

			Intersection Approach Lanes[1]												Peak Hour Level Of Service			Project
		Traffic	Northbound			Southbound			Eastbound			Westbound			Weekday		Saturday	Significant
Intersection	Jurisdiction	Control[2]	L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening	Mid-day	Impact
Fullerton Road (NS) at:																		
Gale Avenue (EW) - #1	City of Industry																	
- Without Improvements		TS	2	2	1>	1	2.5	0.5	1	2	1>	1	1.5	0.5	0.673-B	0.731-C	0.879-D	Yes
- With Improvements		TS	2	2	1>	1	2.5	0.5	1	2	1>	**2**	1.5	0.5	0.673-B	0.657-B	0.802-D	No
SR-60 Freeway WB Ramps (EW) - #2	Caltrans																	
	Intersection Capacity Utilization	TS	0	3	1>>	0	3	0	0	0	0	1.5	0	1.5	0.562-A	0.501-A	0.606-B	No
	Highway Capacity Manual	TS	0	3	1>>	0	3	0	0	0	0	1.5	0	1.5	20.3-C	17.1-B	20.5-C	
SR-60 Freeway EB Ramps (EW) - #3	Caltrans																	
- Without Improvements	Intersection Capacity Utilization	TS	0	1.5	0.5	1	2	1>>	1.5	0.5	1>>	2	0	1	0.713-C	0.723-C	0.931-E	Yes
	Highway Capacity Manual	TS	0	1.5	0.5	1	2	1>>	1.5	0.5	1>>	2	0	1	19.3-B	16.0-B	26.3-C	
- With Improvements	Intersection Capacity Utilization	TS	0	**2.5**	0.5	1	2	1>>	1.5	0.5	1>>	2	0	1	0.569-A	0.573-A	0.759-C	No
	Highway Capacity Manual	TS	0	**2.5**	0.5	1	2	1>>	1.5	0.5	1>>	2	0	1	19.0-B	16.6-B	23.8-C	
Colima Road (EW) - #4	County of Los Angeles	TS	2	1.5	0.5	2	1.5	0.5	2	2.5	0.5	2	2.5	0.5	0.796-C	0.847-D	0.885-D	Yes
Coiner Court (NS) at:																		
Gale Avenue (EW) - #5	City of Industry	TS	0	0	0	1	0	1	1	2	0	0	1.5	0.5	0.368-A	0.488-A	0.401-A	No
Project West Access (NS) at:																		
Gale Avenue (EW) - #6	County of Los Angeles	**CSS**	0	0	0	**0.5**	0	**0.5**	**1**	2	0	0	1.5	**0.5**	0.380-A	0.454-A	0.433-A	No
Project Central Access (NS) at:																		
Gale Avenue (EW) - #7	County of Los Angeles																	
- Without Improvements		CSS	0.5	0	0.5	0	0	0	0	1.5	0.5	1	2	0	0.452-A	0.532-A	0.519-A	No
- With Improvements		**TS**	0	1	0	0	**1**	0	**1**	1.5	0.5	1	1.5	0.5	0.452-A	0.513-A	0.517-A	No
Project East Access (NS) at:																		
Gale Avenue (EW) - #8	County of Los Angeles	TS	0	1	0	0.5	0.5	1	1	1.5	0.5	1	1.5	0.5	0.492-A	0.662-B	0.824-D	No
Nogales Street (NS) at:																		
Shadow Oak Drive (EW) - #9	City of Walnut	TS	1	2	d	1	2	d	1	1.5	0.5	1	1.5	0.5	0.702-C	0.569-A	0.585-A	No
La Puente Road (EW) - #10	County of Los Angeles/City of West Covina	TS	1	2	1	1	2	d	0	1	0	0.5	0.5	1	0.848-D	0.808-D	0.819-D	Yes
Valley Boulevard Loop (EW) - #11	City of West Covina	TS	1	2.5	0.5	1	2.5	0.5	0	1	0	1.5	0.5	1	0.654-B	0.655-B	0.566-A	No
Valley Boulevard Loop (NS) at:																		
Valley Boulevard (EW) - #12	City of West Covina	TS	0	0	0	2	0	1	2	3	0	0	2.5	0.5	0.581-A	0.415-A	0.363-A	No
Nogales Street (NS) at:																		
San Jose Avenue (EW) - #13	County of Los Angeles/City of Industry	TS	1	2.5	0.5	1	2.5	0.5	0.5	0.5	1	0.5	0.5	1	0.661-B	0.921-E	0.606-B	Yes
Gale Avenue/Walnut Drive (EW) - #15	County of Los Angeles/City of Industry	TS	1	2.5	0.5	1	2.5	0.5	1	1	d	1	1	d	0.934-E	1.358-F	1.291-F	Yes
SR-60 Freeway WB Ramps (EW) - #16	Caltrans																	
	Intersection Capacity Utilization	TS	0	3	1>>	0	3	1>>	0	0	0	0.5	0	1.5	0.679-B	0.663-B	0.700-B	No
	Highway Capacity Manual	TS	0	3	1>>	0	3	1>>	0	0	0	0.5	0	1.5	26.0-C	26.2-C	29.7-C	
SR-60 Freeway EB Ramps (EW) - #17	Caltrans																	
	Intersection Capacity Utilization	TS	0	3	1>>	0	3	1>>	1.5	0	0.5	0	0	0	0.562-A	0.701-C	0.618-B	No
	Highway Capacity Manual	TS	0	3	1>>	0	3	1>>	1.5	0	0.5	0	0	0	23.6-C	27.96-C	25.7-C	
Colima Road (EW) - #18	County of Los Angeles																	
- Without Improvements		TS	2	2	1	2	2	1	2	2.5	0.5	2	2.5	0.5	0.841-D	0.753-C	0.871-D	Yes
- With Improvements		TS	2	2	1	2	2	1	2	2.5	0.5	2	3	**1>**	0.755-C	0.742-C	0.801-D	No

[1]When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes (de facto right turn lane). L = Left; T = Through; R = Right; d = De Facto Right Turn Lane; 1> = Right Turn Overlap; 1>> = Free Right Turn Lane

[2]TS = Traffic Signal; CSS = Cross Street Stop

Table 7

Existing Plus Project Plus Cumulative Significant Impact Evaluation

				Existing Plus Project Plus Cumulative							
		Existing		Without Improvements				With Improvements			
Intersection	Peak Hour	Intersection Capacity Utilization	Level of Service	Intersection Capacity Utilization	Level of Service	Project Impact	Significant Impact[1]	Intersection Capacity Utilization	Level of Service	Project Impact	Significant Impact[1]
Fullerton Road (NS) at:											
Gale Avenue (EW) - #1	Weekday Morning	0.657	B	0.673	B	0.016	No	0.673	B	0.016	No
	Weekday Evening	0.649	B	0.731	C	0.082	Yes	0.657	B	0.008	No
	Saturday Mid-day	0.792	C	0.879	D	0.087	Yes	0.802	D	0.010	No
SR-60 Freeway WB Ramps (EW) - #2	Weekday Morning	0.537	A	0.562	A	0.025	No				
	Weekday Evening	0.471	A	0.501	A	0.030	No				
	Saturday Mid-day	0.566	A	0.606	B	0.040	No				
SR-60 Freeway EB Ramps (EW) - #3	Weekday Morning	0.663	B	0.713	C	0.050	Yes	0.569	A	-0.094	No
	Weekday Evening	0.657	B	0.732	C	0.075	Yes	0.573	A	-0.084	No
	Saturday Mid-day	0.847	D	0.931	E	0.084	Yes	0.759	C	-0.088	No
Colima Road (EW) - #4[2]	Weekday Morning	0.773	C	0.796	C	0.023	No				
	Weekday Evening	0.825	D	0.847	D	0.022	Yes				
	Saturday Mid-day	0.841	D	0.885	D	0.044	Yes				
Coiner Court (NS) at:											
Gale Avenue (EW) - #5	Weekday Morning	0.336	A	0.368	A	0.032	No				
	Weekday Evening	0.427	A	0.488	A	0.061	No				
	Saturday Mid-day	0.329	A	0.401	A	0.072	No				
Nogales Street (NS) at:											
Shadow Oak Drive (EW) - #9	Weekday Morning	0.666	B	0.702	C	0.036	No				
	Weekday Evening	0.518	A	0.569	A	0.051	No				
	Saturday Mid-day	0.522	A	0.585	A	0.063	No				
La Puente Road (EW) - #10[2]	Weekday Morning	0.818	D	0.848	D	0.030	Yes				
	Weekday Evening	0.774	C	0.808	D	0.034	Yes				
	Saturday Mid-day	0.774	C	0.819	D	0.045	Yes				
Valley Boulevard Loop (EW) - #11	Weekday Morning	0.638	B	0.654	B	0.016	No				
	Weekday Evening	0.630	B	0.655	B	0.025	No				
	Saturday Mid-day	0.533	A	0.566	A	0.033	No				
Valley Boulevard Loop (NS) at:											
Valley Boulevard (EW) - #12	Weekday Morning	0.565	A	0.581	A	0.016	No				
	Weekday Evening	0.399	A	0.415	A	0.016	No				
	Saturday Mid-day	0.331	A	0.363	A	0.032	No				
Nogales Street (NS) at:											
San Jose Avenue (EW) - #13[2]	Weekday Morning	0.641	B	0.661	B	0.020	No				
	Weekday Evening	0.896	D	0.921	E	0.025	Yes				
	Saturday Mid-day	0.569	A	0.606	B	0.037	No				
Gale Avenue/Walnut Drive (EW) - #15[2]	Weekday Morning	0.820	D	0.934	E	0.114	Yes				
	Weekday Evening	1.125	F	1.358	F	0.233	Yes				
	Saturday Mid-day	1.002	F	1.291	F	0.289	Yes				
SR-60 Freeway WB Ramps (EW) - #16	Weekday Morning	0.647	B	0.679	B	0.032	No				
	Weekday Evening	0.630	B	0.663	B	0.033	No				
	Saturday Mid-day	0.631	B	0.700	B	0.069	No				
SR-60 Freeway EB Ramps (EW) - #17	Weekday Morning	0.549	A	0.562	A	0.013	No				
	Weekday Evening	0.684	B	0.701	C	0.017	No				
	Saturday Mid-day	0.596	A	0.618	B	0.022	No				
Colima Road (EW) - #18[2]	Weekday Morning	0.810	D	0.841	D	0.031	Yes				
	Weekday Evening	0.720	C	0.753	C	0.033	No				
	Saturday Mid-day	0.825	D	0.871	D	0.046	Yes				

[1] In Los Angeles County, an impact is considered significant if the project related increase in the volume to capacity ratio equals or exceeds the thresholds shown below:

Significant Impact Threshold for Intersections		
Level of Service	Volume/Capacity	Incremental Increase
C	0.71-0.80	0.04 or more
D	0.81-0.90	0.02 or more
E/F	0.91-more	0.01 or more

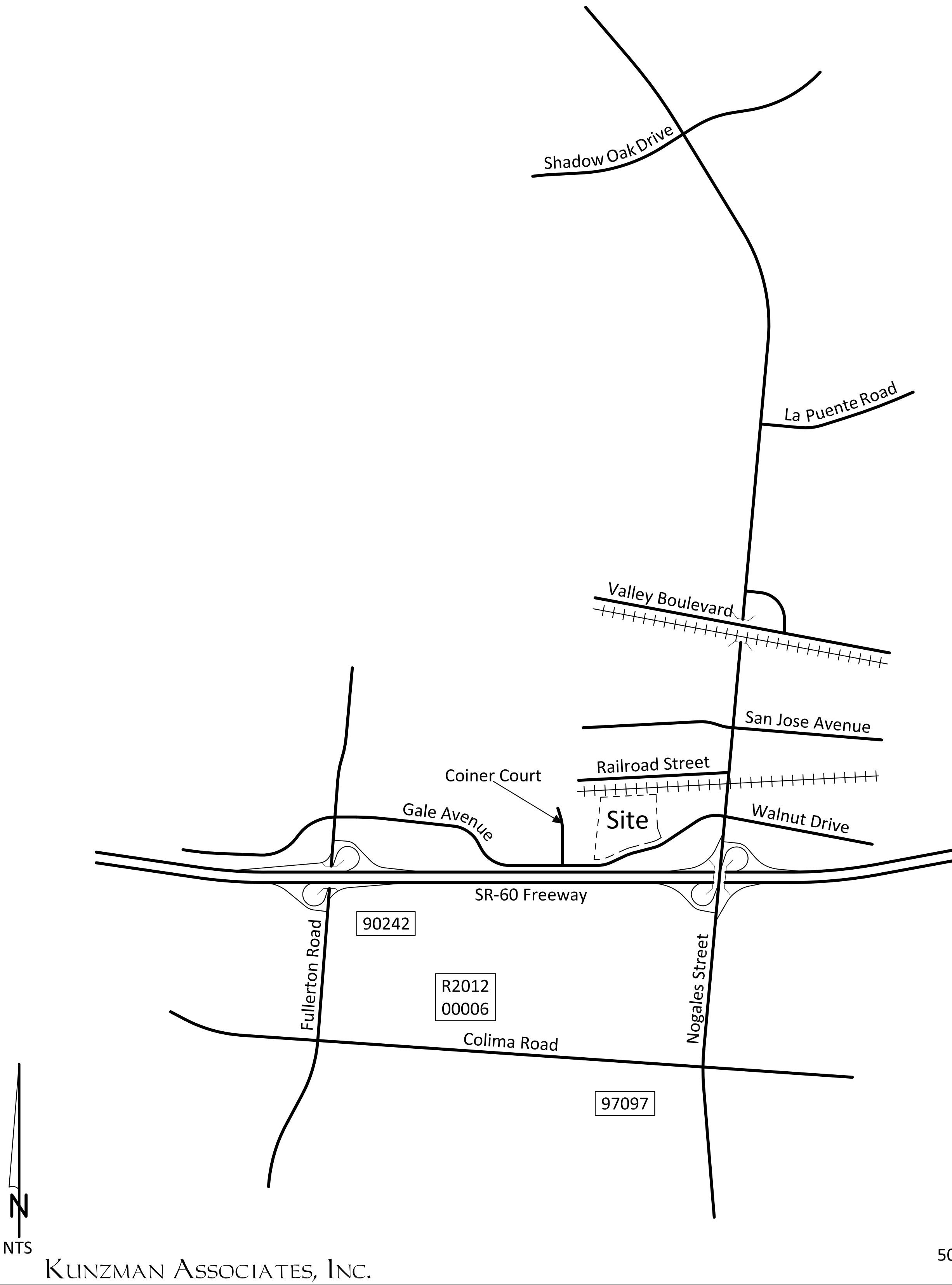
[2] Based on discussions with the County of Los Angeles, improvements at this intersection are either currently planned or infeasible.

Table 8

Project Fair Share Calculations

Intersection	Improvement	Existing Traffic			Existing Plus Project Plus Cumulative Traffic			Project Traffic			Total New Traffic			Project Percent of New Traffic			Project Fair Share Percentage
		Weekday		Saturday	Weekday		Saturday	Weekday		Saturday	Weekday		Saturday	Weekday		Saturday	
		Morning	Evening	Mid-day	Morning	Evening	Mid-day	Morning	Evening	Mid-day	Morning	Evening	Mid-day	Morning	Evening	Mid-day	
Fullerton Road (NS) at:																	
Gale Avenue (EW) - #1	Construct an additional westbound left turn lane	3,084	3,397	3,731	3,308	3,729	4,158	218	325	218	224	332	427	97.3%	97.9%	51.1%	97.9%
SR-60 Freeway EB Ramps (EW) - #3	Construct an additional northbound through travel lane	3,201	3,282	3,984	3,390	3,541	4,320	146	210	269	189	259	336	77.2%	81.1%	80.1%	81.1%

Figure 26
Related Projects Location Map



5089e/26

Figure 27
Related Projects Outbound Trip Distribution - 90242

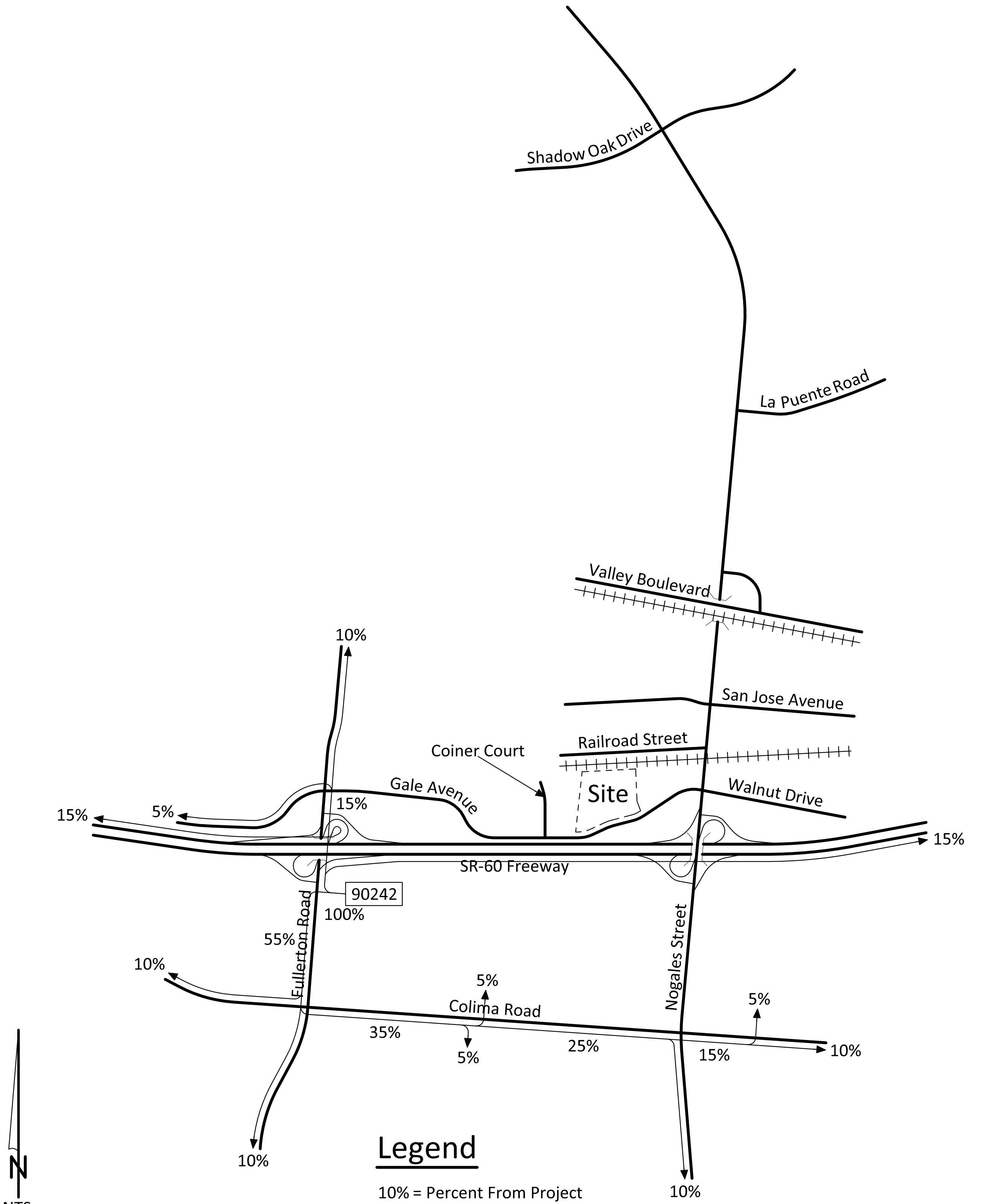


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Figure 28
Related Projects Inbound Trip Distribution - 90242

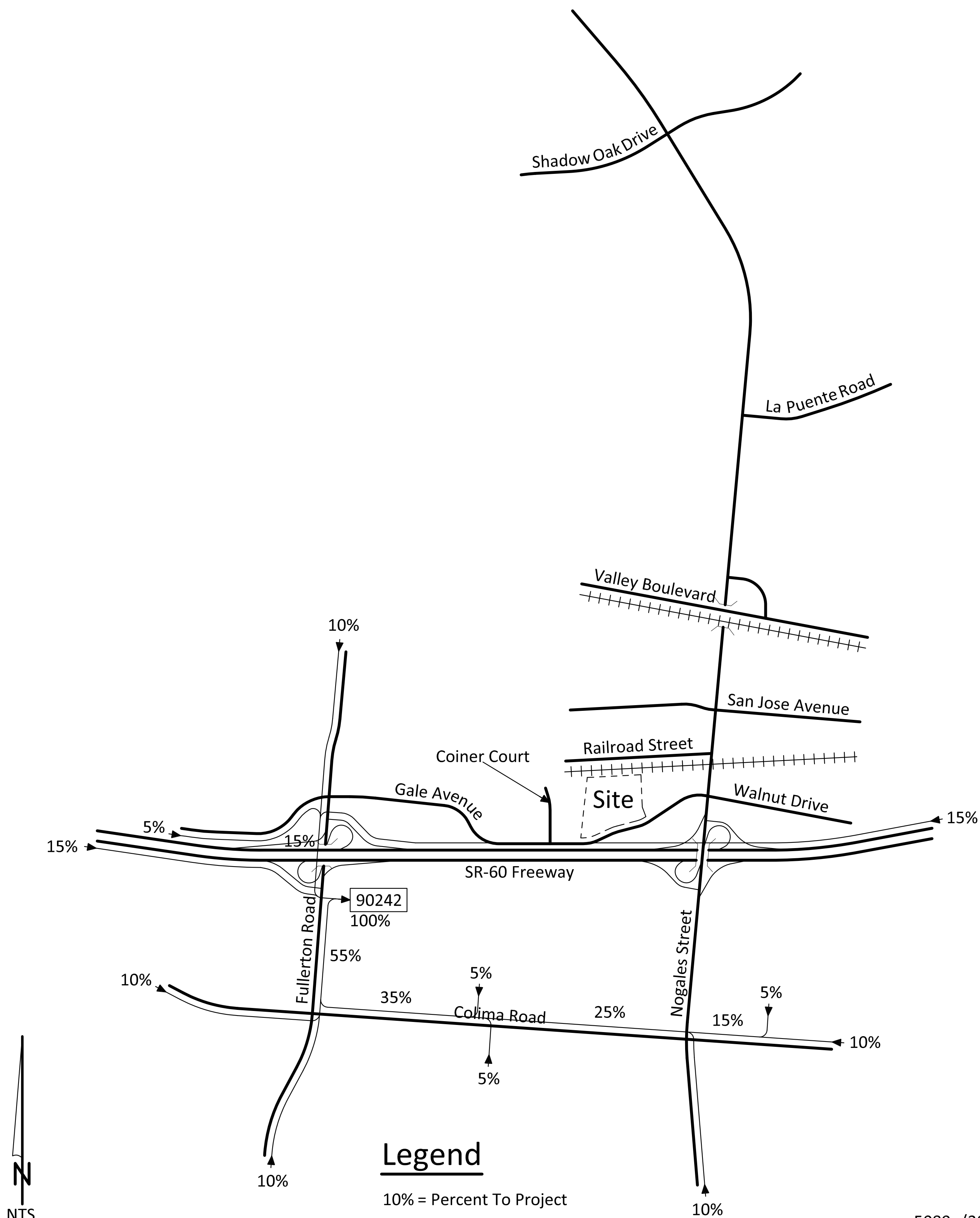

Figure 29
Related Projects Outbound Trip Distribution - 97097

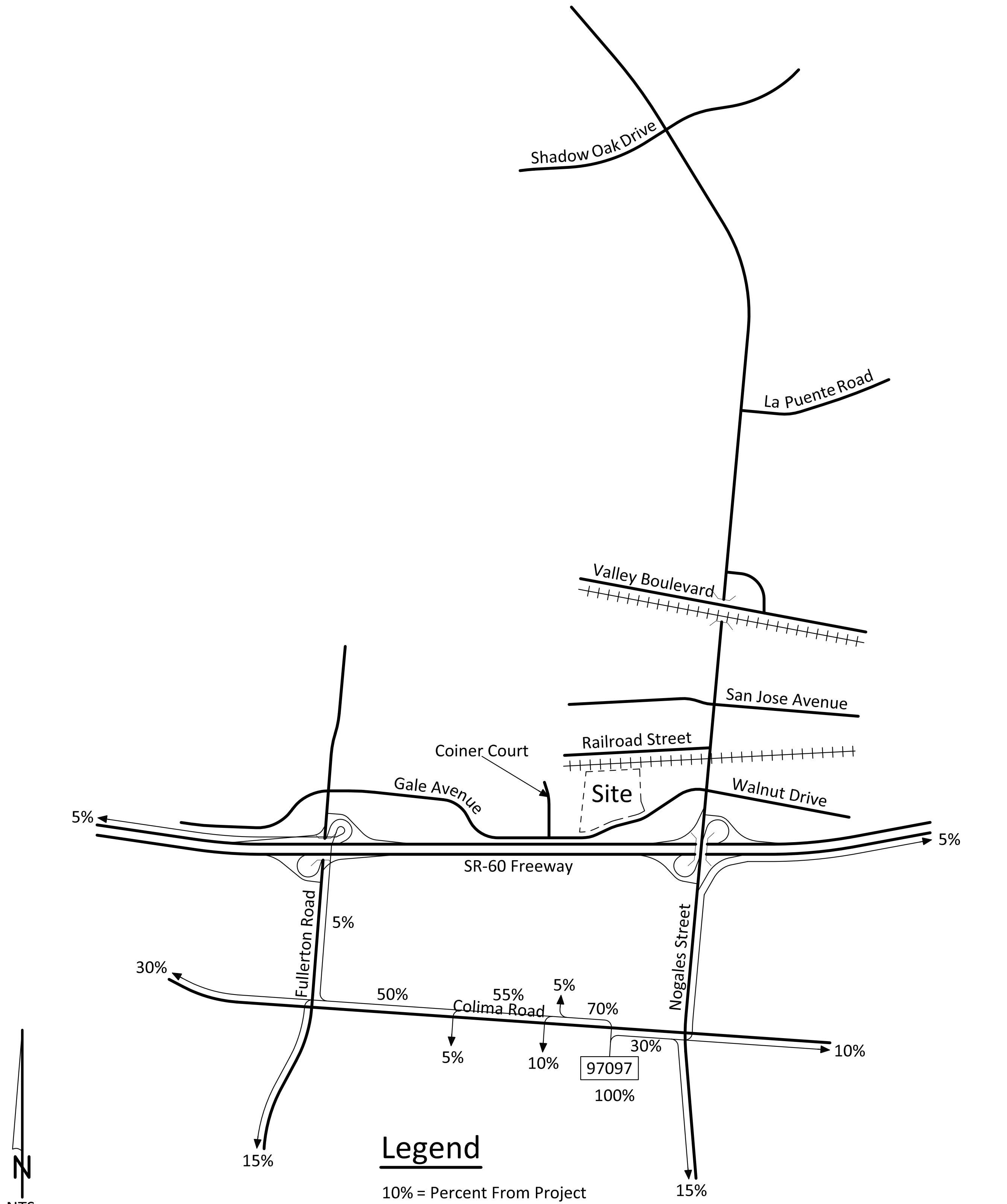

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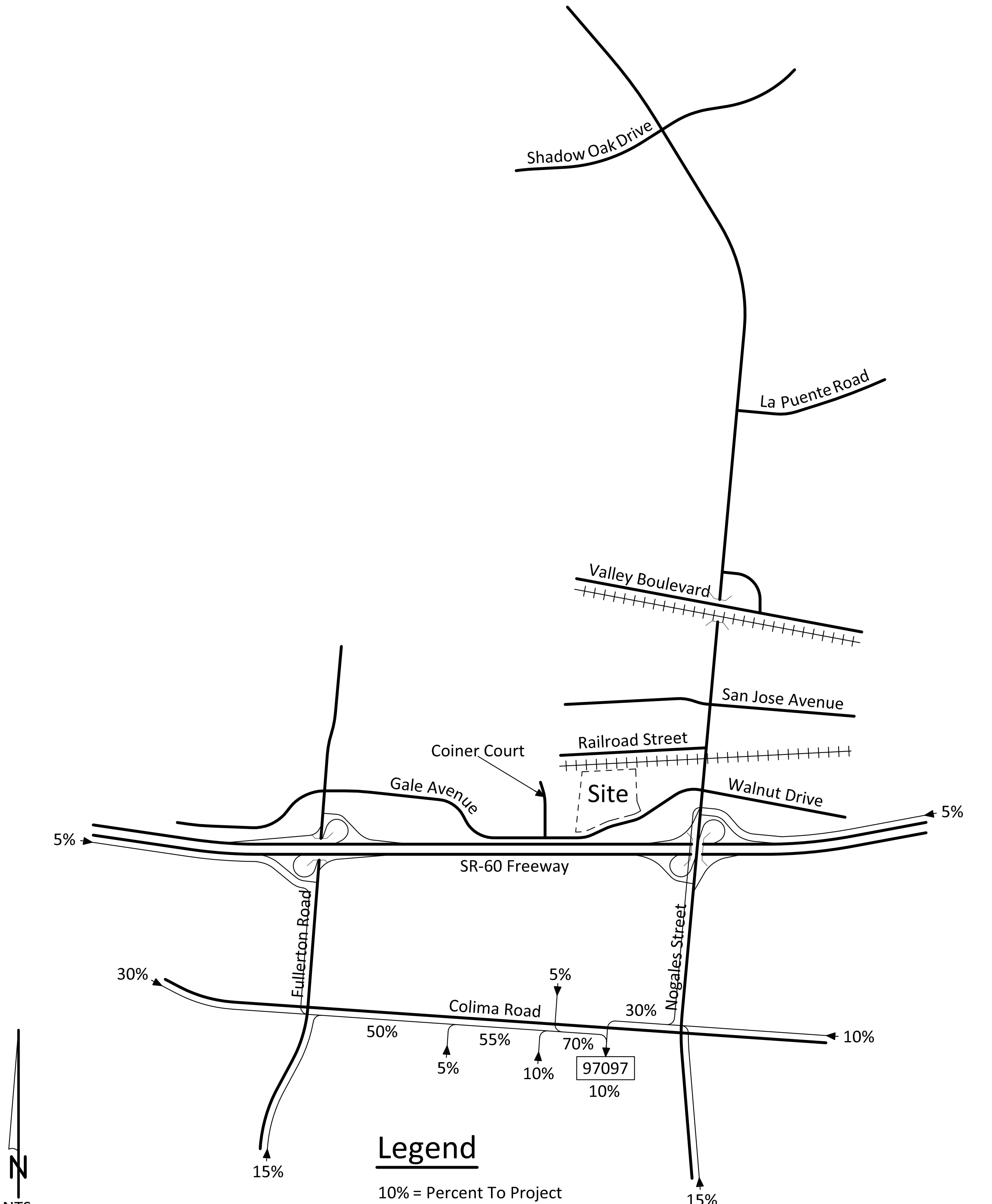
Figure 30
Related Projects Inbound Trip Distribution - 97097



5089e/30

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Figure 31
Related Projects Outbound Trip Distribution - R2012-00006

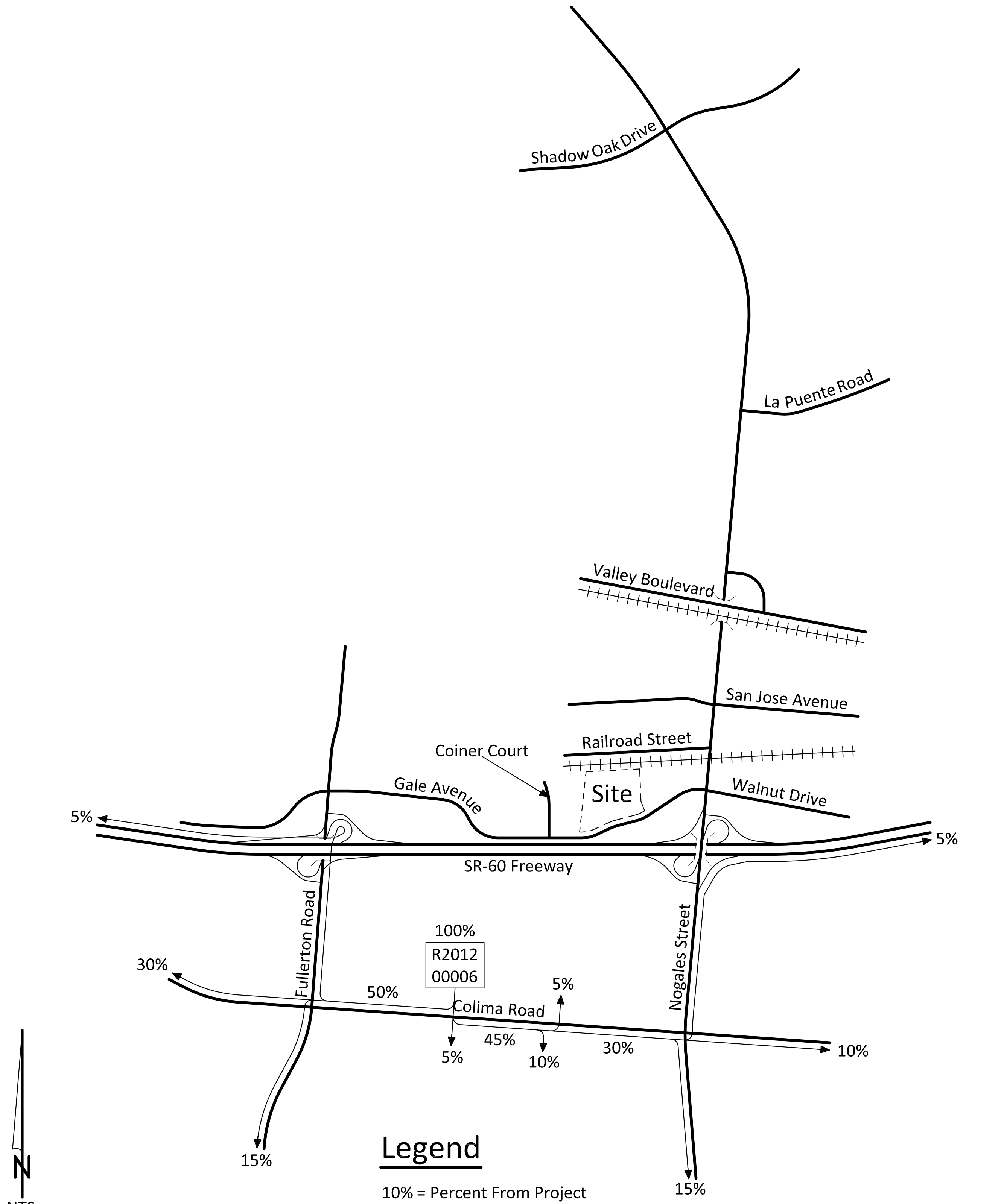

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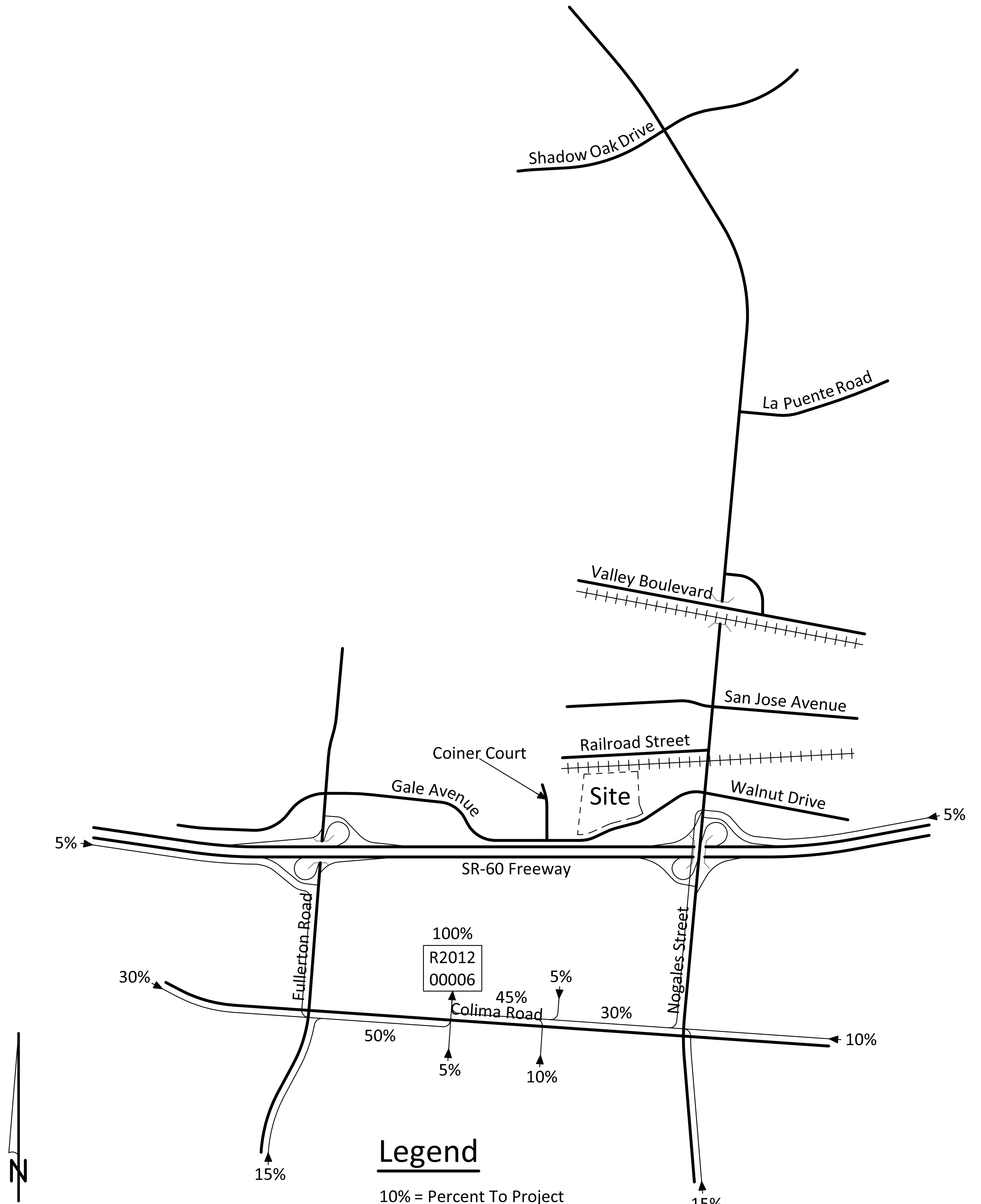
Figure 32
Related Projects Inbound Trip Distribution - R2012-00006



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OVER 35 YEARS OF EXCELLENT SERVICE

Figure 33
Related Projects Average Daily Traffic Volumes

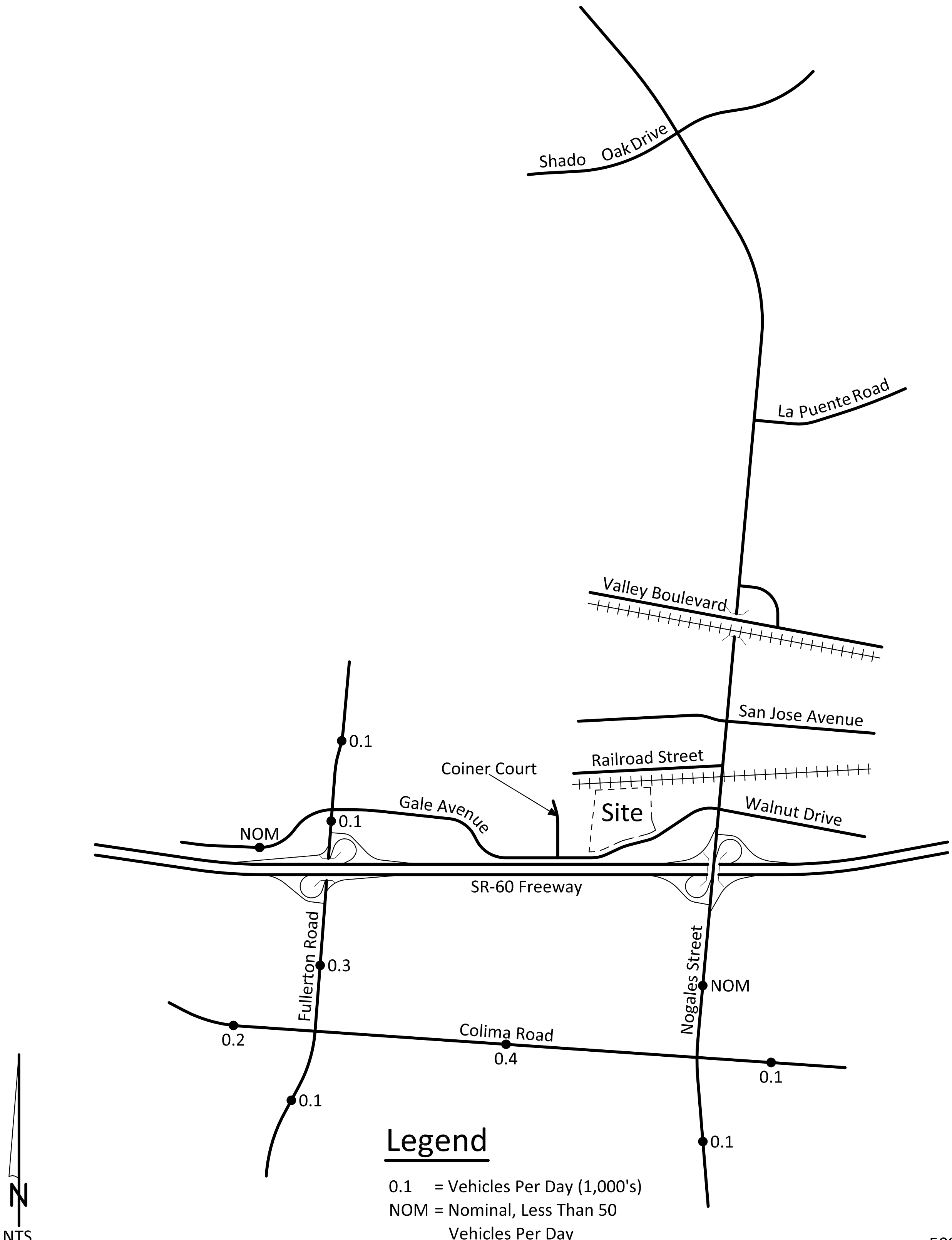

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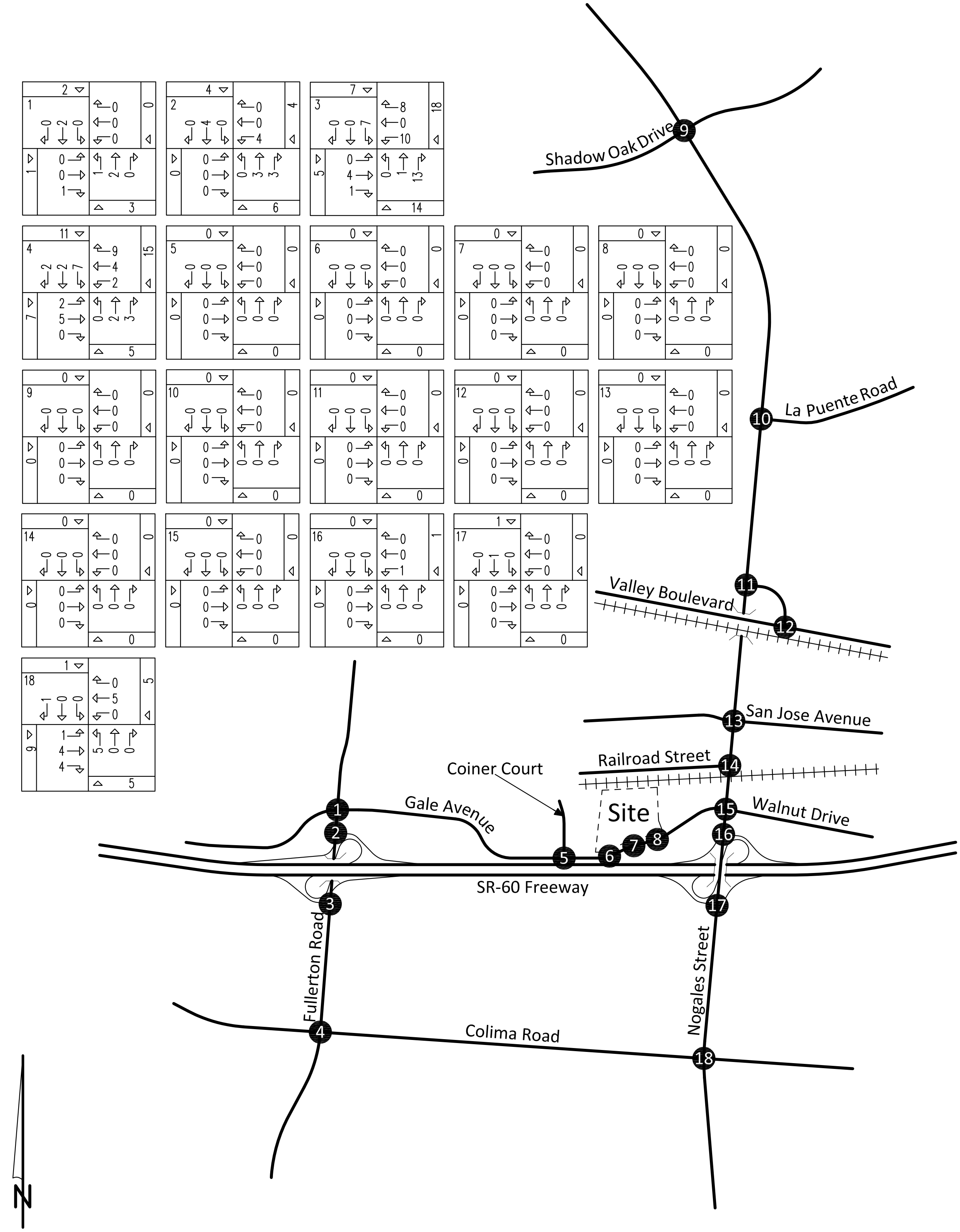
Figure 34
Related Projects Weekday
Morning Peak Hour Intersection Turning Movement Volumes

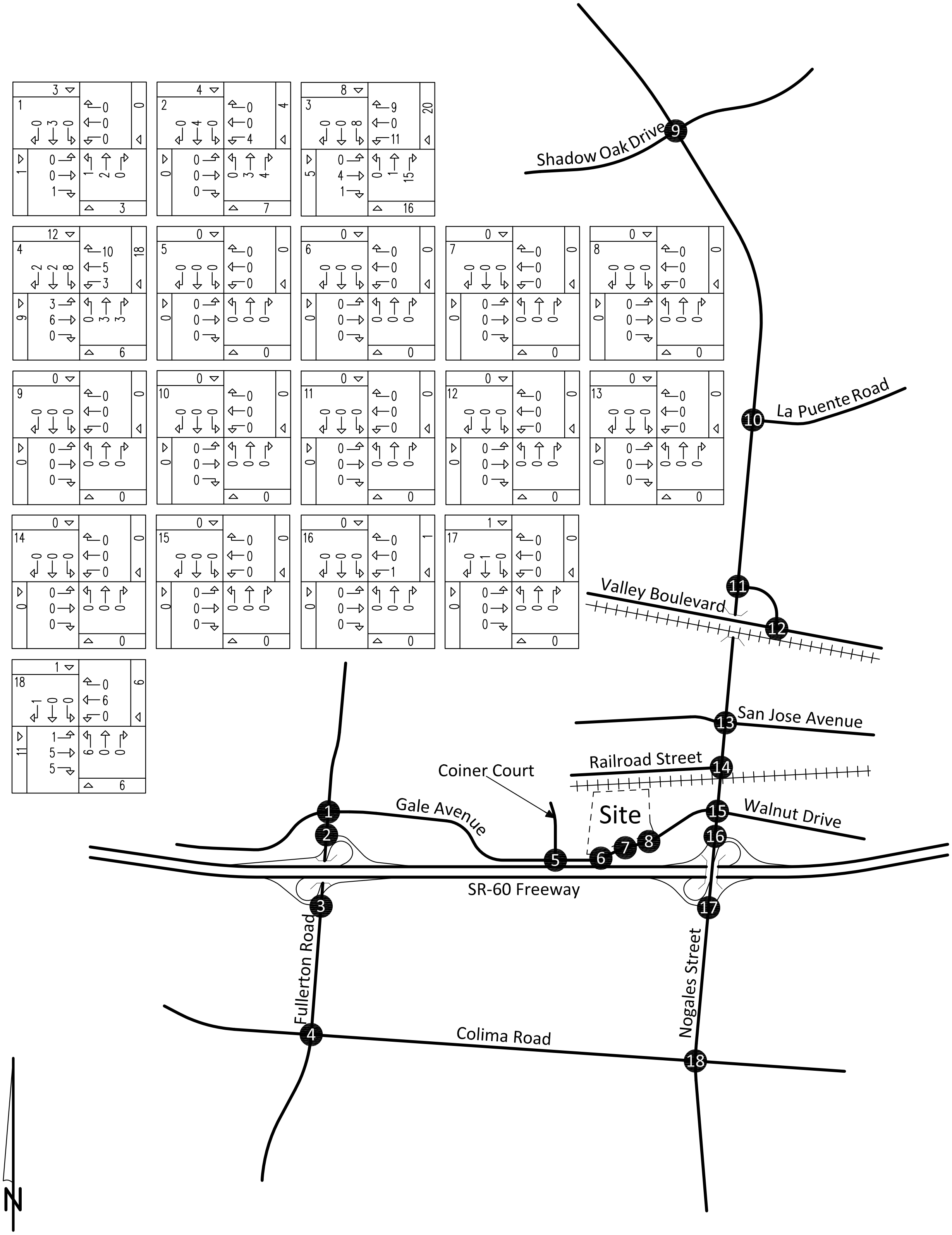


5089e/34

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 35
Related Projects Weekday
Evening Peak Hour Intersection Turning Movement Volumes

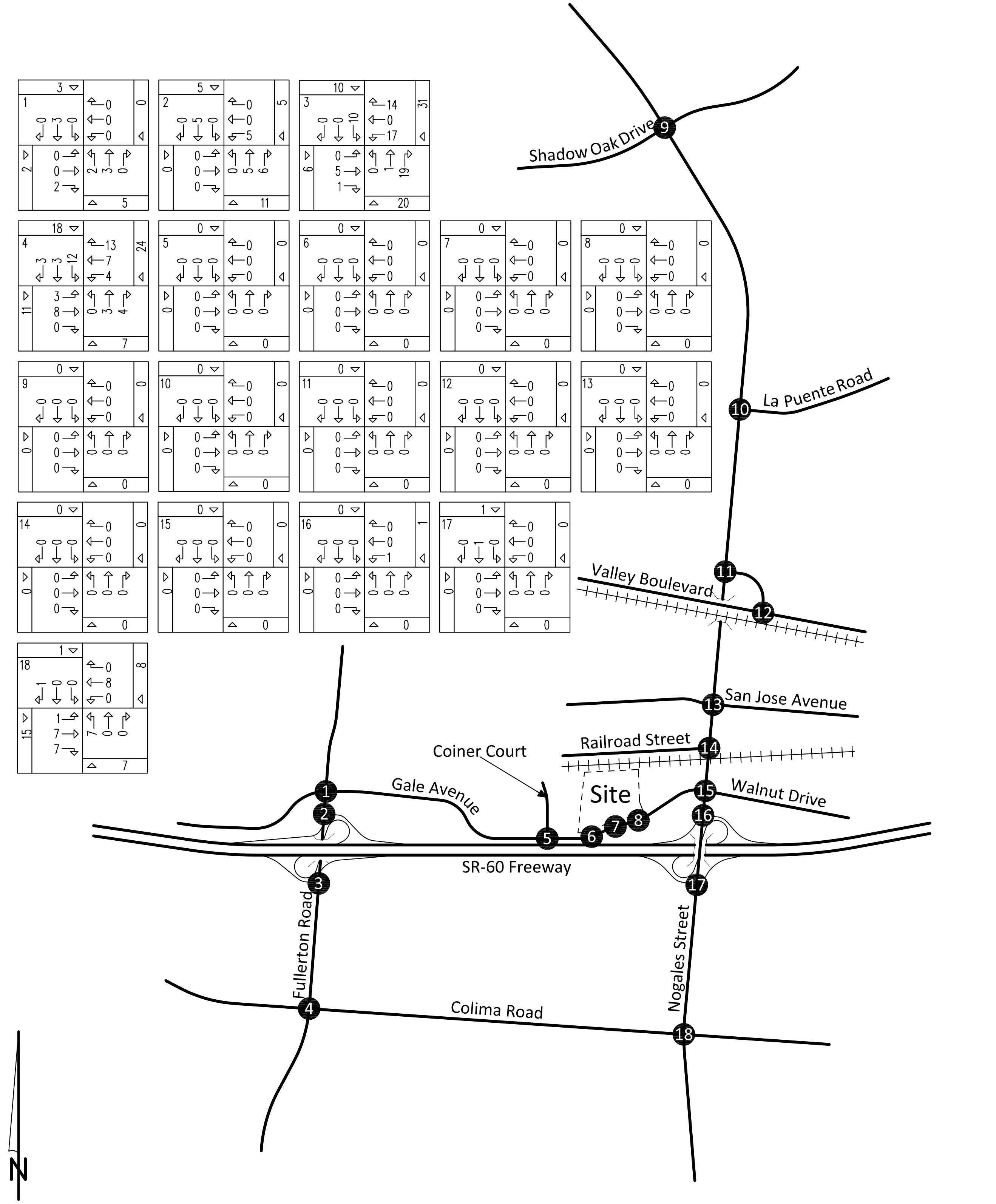


5089e/35

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 36
Related Projects Saturday
Mid-Day Peak Hour Intersection Turning Movement Volumes

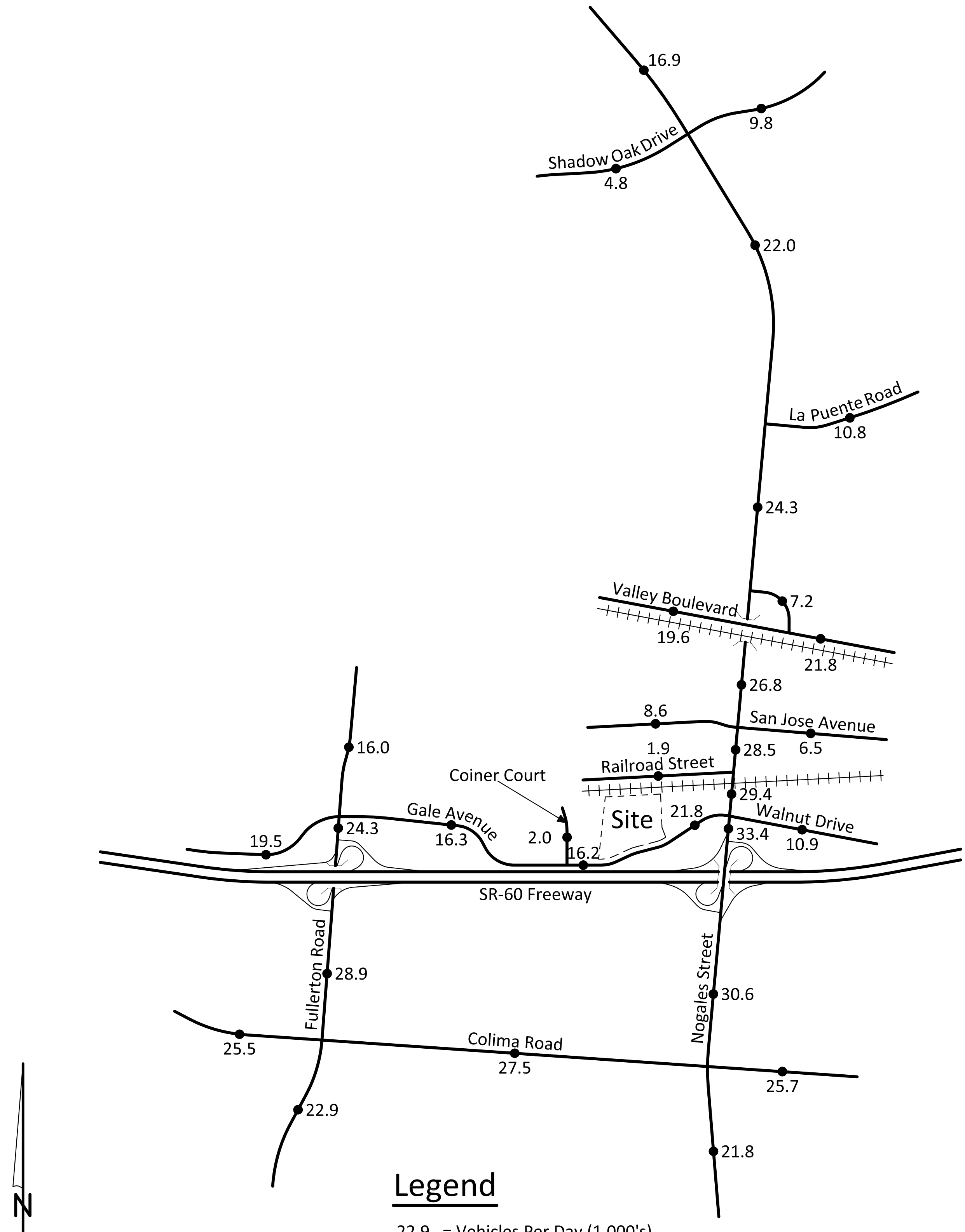


5089e/36

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 37
Existing Plus Project Plus Cumulative
Average Daily Traffic Volumes



Legend

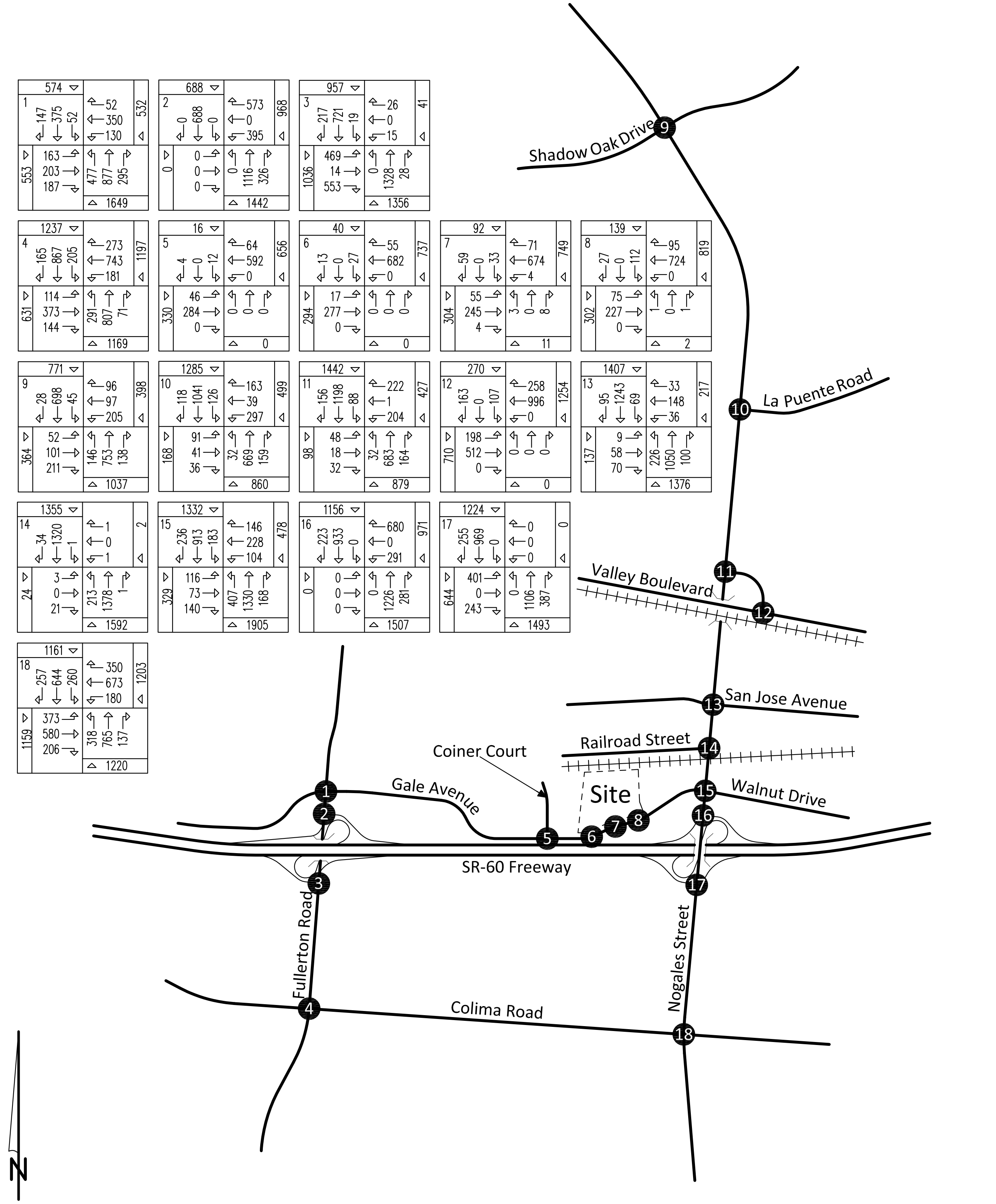
22.9 = Vehicles Per Day (1,000's)

5089e/37

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 38
Existing Plus Project Plus Cumulative Weekday Morning Peak Hour Intersection Turning Movement Volumes

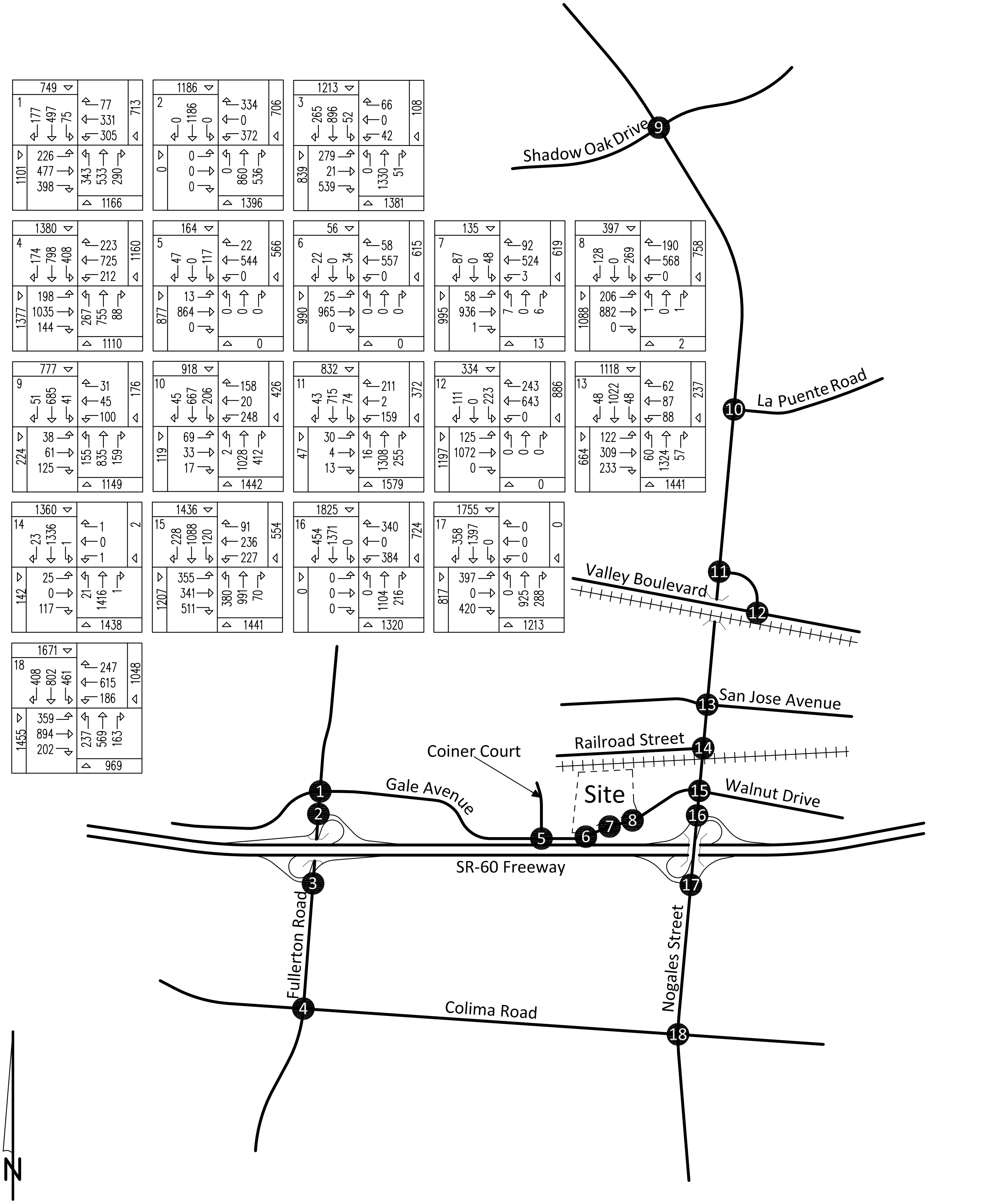


5089e/38

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 39
Existing Plus Project Plus Cumulative Weekday Evening Peak Hour Intersection Turning Movement Volumes

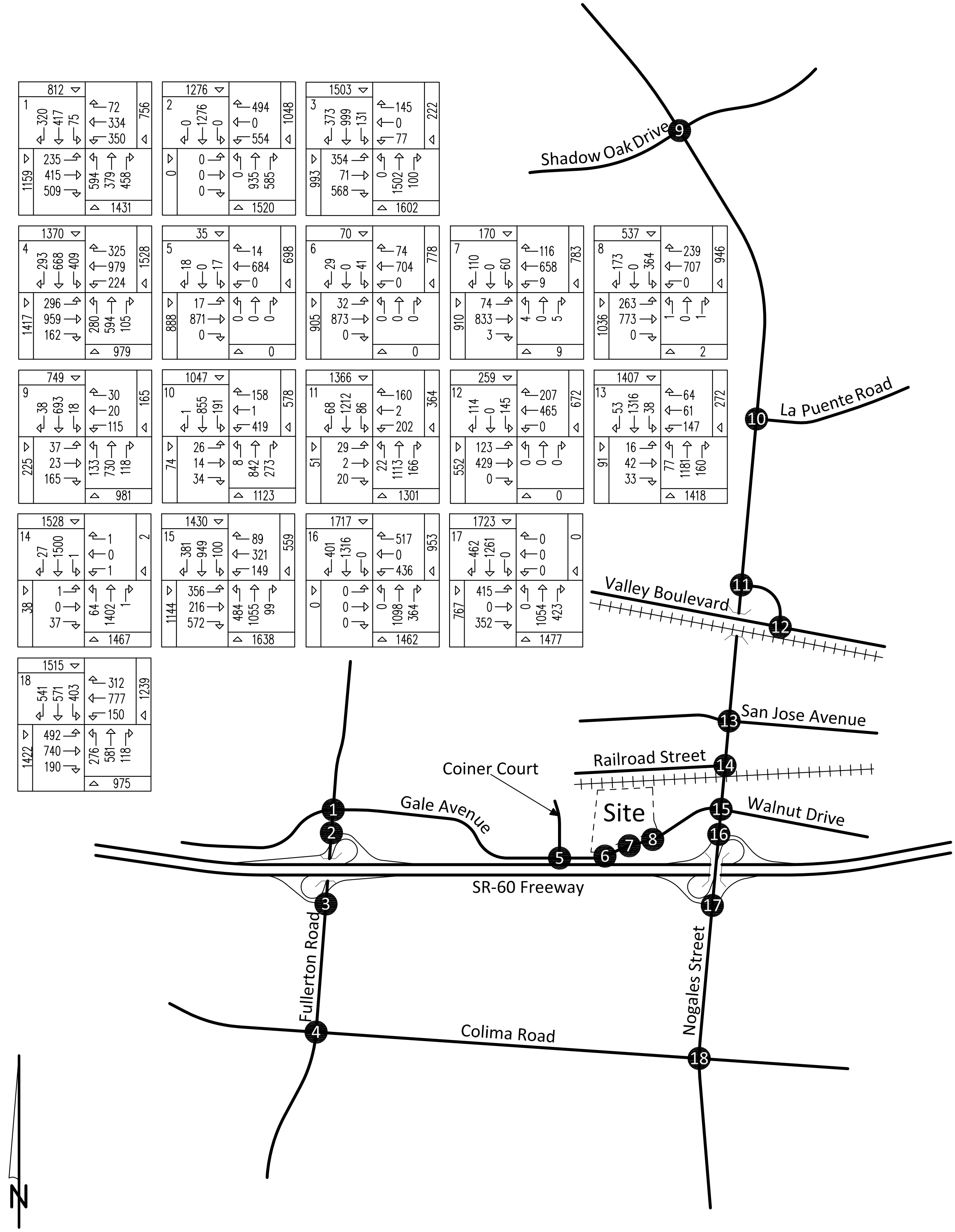


5089e/39

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 40
Existing Plus Project Plus Cumulative Saturday
Mid-Day Peak Hour Intersection Turning Movement Volumes



5089e/40

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 35 YEARS OF EXCELLENT SERVICE

VIII. Recommendations

A. **Roadway Improvements**

Site-specific circulation and access recommendations are depicted on Figure 41.

Sight distance at the project accesses will be reviewed with respect to Caltrans/Los Angeles County standards in conjunction with the preparation of final grading, landscaping, and street improvement plans.

On-site traffic signing and striping will be implemented in conjunction with detailed construction plans for the project.

B. Traffic Signal Warrant Analysis

Traffic signals are projected to be warranted at the following study area intersections for Existing Plus Project traffic conditions (see Appendix E):

Project Central Access (NS) at:
Gale Avenue (EW) - #7

Project East Access (NS) at:
Gale Avenue (EW) - #8

The unsignalized intersections have been evaluated for traffic signals using the Caltrans Warrant 3 Peak Hour traffic signal warrant analysis, as specified in the California Manual of Uniform Traffic Control Devices (2014 Edition).

C. Project Significant Impact Mitigation Measures

The following mitigation measures are recommended to reduce the project impact to less than significant for all traffic scenarios at the affected intersections:

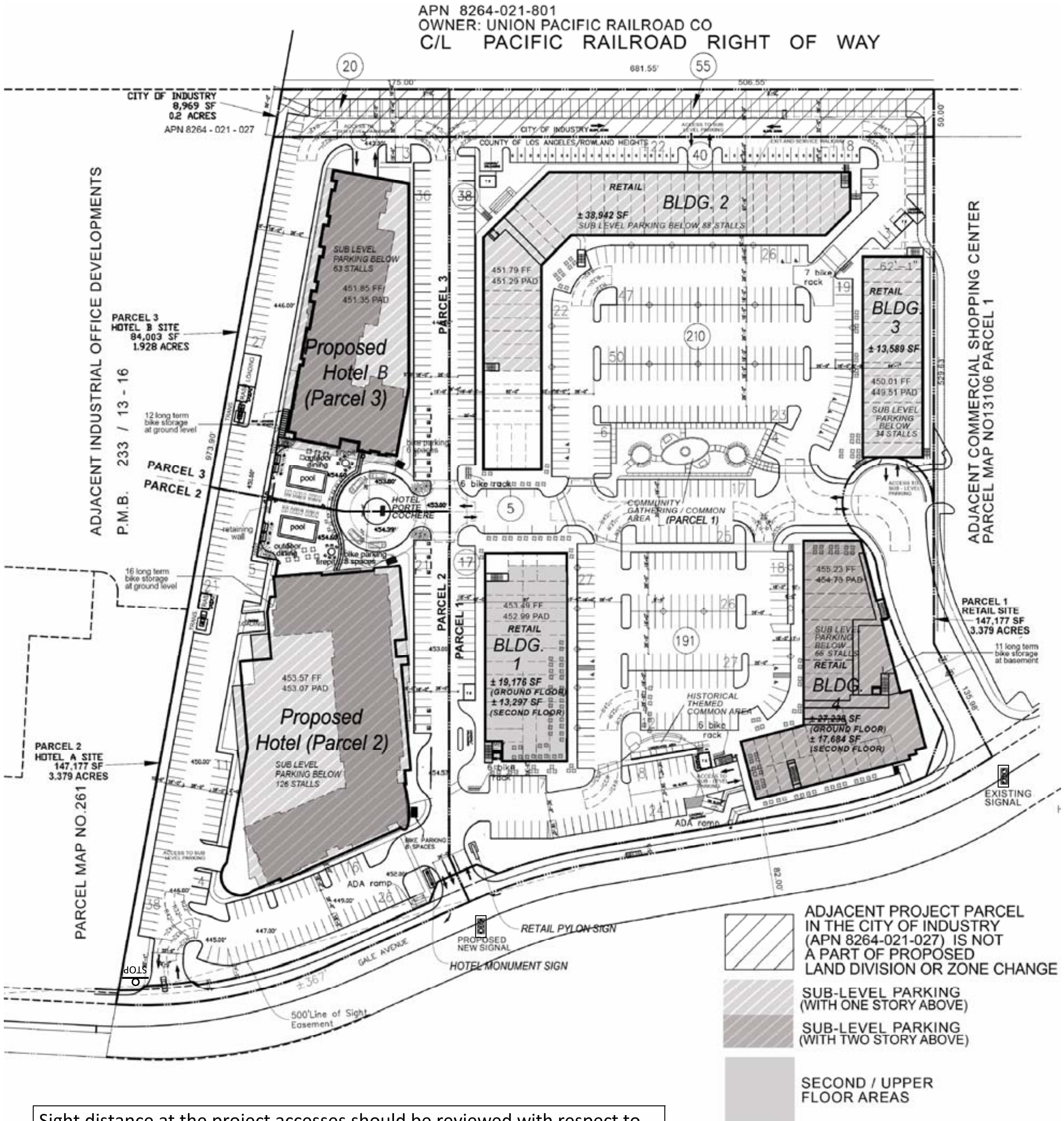
Fullerton Road (NS) at:
Gale Avenue (EW) - #1
- Construct an additional westbound left turn lane

SR-60 Freeway EB Ramps (EW) - #3
- Construct a northbound thru travel lane

Project fair share percentages are calculated in Table 8.

It should be noted that the Fullerton Road at Colima Road and Nogales Street and Colima Road intersections currently operate at acceptable Levels of Service and are projected to continue to operate at acceptable Levels of Service without or with the project.

Figure 41
Circulation Recommendations



Sight distance at the project accesses should be reviewed with respect to California Department of Transportation/Los Angeles County standards in conjunction with the preparation of final grading, landscaping, and street improvement plans.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project.

As is the case for any roadway design, the County of Los Angeles should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

Legend

= Traffic Signal
STOP = Stop Sign

N
NTS

KUNZMAN ASSOCIATES, INC.

5089e/41

Appendices

Appendix A – Glossary of Transportation Terms

Appendix B – Scoping Agreement

Appendix C – Traffic Count Worksheets

Appendix D – Explanation and Calculation of Intersection Capacity Utilization/Delay

Appendix E – Traffic Signal Warrant Worksheets

Appendix F – Pass-By Trips

Appendix G – California Department of Transportation Freeway Off-Ramp Queue Analysis

Appendix H – California Department of Transportation Highway Capacity Manual Level of Service Calculations

Appendix I – California Department of Transportation Freeway Mainline Analysis

Appendix J – Intersection Improvements Striping Overlays

APPENDIX A

Glossary of Transportation Terms

GLOSSARY OF TRANSPORTATION TERMS

COMMON ABBREVIATIONS

AC:	Acres
ADT:	Average Daily Traffic
Caltrans:	California Department of Transportation
DU:	Dwelling Unit
ICU:	Intersection Capacity Utilization
LOS:	Level of Service
TSF:	Thousand Square Feet
V/C:	Volume/Capacity
VMT:	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The total volume during a year divided by the number of days in a year. Usually only weekdays are included.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A constriction along a travelway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CYCLE LENGTH: The time period in seconds required for one complete signal cycle.

CUL-DE-SAC STREET: A local street open at one end only, and with special provisions for turning around.

DAILY CAPACITY: The daily volume of traffic that will result in a volume during the peak hour equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

ORIGIN-DESTINATION SURVEY: A survey to determine the point of origin and the point of destination for a given vehicle trip.

PASSENGER CAR EQUIVALENTS (PCE): One car is one Passenger Car Equivalent. A truck is equal to 2 or 3 Passenger Car Equivalents in that a truck requires longer to start, goes slower, and accelerates slower. Loaded trucks have a higher Passenger Car Equivalent than empty trucks.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through a signalized intersection.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination; i.e. each trip has two trip-ends. A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quantity of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

Scoping Agreement

SCOPING FOR TRAFFIC STUDY

Project Name:	Rowland Heights Plaza

This Memorandum of Understanding (MOU) acknowledges Los Angeles County Department of Public Works, Traffic and Lighting Division (TLD) requirements of traffic impact analysis for the project and is subject to change:

Project Address:	18850 East Gale Avenue – **See Figure 1**		
Project Description:	Retail Center and Two Hotels – **See Figure 2**		
City:	Rowland Heights		
Project Buildout Year:	2017	**Ambient or CMP Growth Rate per Year:**	0.0%
Closest Intersection (Xtn) to the Project			
Xtn N/S Street Name:	Nogales Street		
Xtn E/W Street Name:	Gale Avenue/Walnut Drive		
Thomas Guide Pg+Grid:	679, B4	**Los Angeles County Supervisorial District:**	4

	Consultant	**Developer**
Company:	Kunzman Associates, Inc.	Parallax Investment Corporation
Name:	Robert Kunzman	Stafford Lawson
Address:	1111 West Town & Country Road	247 Davenport Road
City, State, Zip Code:	Orange, CA 92868	Toronto, ON M5R 1J9
Phone #:	1-714-973-8383	1-416-944-0968
Fax #:	1-714-973-8821	1-416-944-0914
Email:	robert@traffic-engineer.com	Stafford@parralaxcorp.ca

By: Robert Kunzman

Print Name: Robert Kunzman

Consultant/Developer's Representative **Date** **12-9-2014**

Reviewed By: Suen Fei Lau

Print Name: Suen Fei LAU 12/17/14

TLD's Representative **Date**

SCOPING FOR TRAFFIC STUDY

Project Name:	Rowland Heights Plaza

1. Traffic Distribution: Figure(s) illustrating project trip distribution in percentages and volumes at the studied intersections analyzed.

See Figures 3 to 10.

	N:	
W:	□ **N**	E
	S:	

Trip Credit: Exact amount of credit subject to approval by TLD.

Transportation Demand Management (TDM)	No	
Existing Active Land Use	No	
Previous Land Use	No	
Internal Trip Reduction	Yes	5% (Commercial) & 10% (Restaurant)
Pass-by Trip Reduction	Yes	10% (Reduced to LA County maximum)

JHau 12/17/14

SCOPING FOR TRAFFIC STUDY

Project Name: Rowland Heights Plaza

2. Trip Generation

Trip Generation Rate(s) Source: ITE Trip Generation	I – Institute of Transportation Engineers; S – San Diego Traffic Generators; C – County; O – Other:	Edition:	9th

Land Use Code	Land Use	Rate Based on	Qty	*AVTE vs	ADT	Weekday a.m. peak		Weekday p.m. peak		Weekend peak hour	
						In	Out	In	Out	In	Out
	Retail, Restaurant, Hotel, Office	I		5,299	10,597	320	234	459	405	580	538

* - Average Vehicle Trip Ends.

See Table 1 and 2

Sthan 12/17/14

SCOPING FOR TRAFFIC STUDY

Project Name:	Rowland Heights Plaza

3. Study Intersections: At minimum, the study shall include the following intersections. The list is subject to change after related projects, trip generation and distribution are determined. Consultant should check with adjoining Cities regarding their requirements in addition to the following County/City intersections. Documentation of the consultation from these agencies shall be included in the traffic study.

Xtn #	% County	Thomas Guide Page+Grid	N/S/E/W Street Name	City	Signalized	CMP
1			See Figure 1		Yes/no	Yes/no
2					Yes/no	Yes/no
3					Yes/no	Yes/no
4					Yes/no	Yes/no
5					Yes/no	Yes/no
6					Yes/no	Yes/no
7					Yes/no	Yes/no
8					Yes/no	Yes/no
9					Yes/no	Yes/no
10					Yes/no	Yes/no

Cites to be consulted: City of Industry – No cumulative projects, just use growth rate (0.5%). County and County shared intersections 0%

See Figure 1

SCOPING FOR TRAFFIC STUDY

Project Name:	Rowland Heights Plaza

4. Related Projects: Consultant should check with Los Angeles County Department of Regional Planning and planning departments of adjoining Cities. Documentation of the consultation from these agencies shall be included in the traffic study. Related projects list shall be submitted to TLD for our review and approval before being incorporated in the study. Obtaining the latest list and paying the $100 fee.

5. Congested Management Program (CMP): A CMP TIA is required for all projects required to prepare an Environmental Assessment based on local determination or projects requiring a traffic study. Where the project meets the criteria established in the Transportation Impact Analysis (TIA section of the County of Los Angeles' CMP TIA Land Use Analysis Guidelines, a CMP analysis must be prepared. At a minimum, the geographic area examined in the TIA must include the following:

- All CMP arterial monitoring intersections (see Appendix A, exhibit A-2, page A-15 of the 2002 Guidelines), including freeway on- or off-ramp intersections, where the proposed project will add 50 or more trips during either the a.m. or p.m. peak hours.
- Main line freeway monitoring locations (see Chapter 2, exhibit 2-4, page 16 of the 2002 Guidelines) where the project will add 150 or more trips, in either direction, during the a.m. or p.m. weekday peak hours.

A copy of the 2002 CMP Land Use Analysis Guidelines can be obtained by calling the CMP Hotline at (213) 922-2830.

6. Freeway Analysis: The potential traffic impact on the following Freeway(s) must be considered.

The applicant shall consult with the State of California Department of Transportation (Caltrans) to determine the California Environmental Quality Act levels of significance with regard to traffic impacts on Caltrans' freeway facilities. This consultation shall also include a determination of Caltrans requirements for the study of traffic impacts to its facilities and the mitigation of any such impacts. This analysis must follow the most current Caltrans' Guide for the Preparation of Traffic Impact Studies (December 2002) and can be obtained from http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tiguide.pdf. If Caltrans finds that the project has a significant impact on the freeway, Caltrans shall be requested to include the basis for this finding in their response. If fees are proposed to mitigate the freeway impact, Caltrans shall be requested to identify the specific project to which the fees will apply. These written comments from Caltrans shall be included with the traffic study and submitted to Public Works for review and approval. If a documented good faith effort is made to consult with Caltrans and written comments cannot be obtained from within a reasonable amount of time, an analysis of the freeway impact shall be made using the County of Los Angeles' CMP Land Use Analysis Guidelines.

X [signature] 4/17/14

SCOPING FOR TRAFFIC STUDY

Project Name:	Rowland Heights Plaza

7. Other:

Traffic counts may be conducted immediately per the following:
• Must be taken on Tuesdays, Wednesdays or Thursdays.
• Must exclude holidays, and the first weekdays before and after the holiday.
• Must be taken on days when local schools or colleges are in session.
• Must be taken on days of good weather, and avoid atypical conditions (e.g., road construction, detours, or major traffic incidents).
• Traffic counts used for other traffic studies in the area shall **NOT** be reused again, unless 25% of the counts conducted for that particular traffic study are validated with new counts. The difference in volumes between the old and new counts at each corresponding movement should not be more than 10%.
• New traffic counts shall be checked to ensure the difference in volumes at corresponding approaches, if applicable, between two adjacent intersections is no more than 10% unless the difference can be justified.
• For all proposed mitigation measures, a conceptual plan for the improvements shall be submitted to our Traffic Studies section for review and approval prior to the approval of the Traffic Impact Analysis. All proposed improvements shall be within the right-of-way.
• For all cumulative mitigation measures, a cost estimate for the improvement shall be submitted.
• Caltrans Off-Ramp storage queuing analysis
construction on the Nogales undercrossing project.

This analysis must follow the most current Traffic Impact Analysis Report Guidelines.

XHau 12/17/14

SCOPING FOR TRAFFIC STUDY

Project Name:	Rowland Heights Plaza

Please return signed page 1 of 8 in person, by Mail or by Fax

In Person	By Mail
Los Angeles County Department of Public Works Traffic and Lighting Division, Traffic Studies Section, Traffic Studies Unit 1000 South Fremont Avenue Building A-9E, 4th Floor Alhambra, CA 91803-8800 **Our building, on the left with parking structure on the right. Check the following web site, for additional information: http://www.thealhambra.net**	**Los Angeles County Department of Public Works Traffic and Lighting Division, Traffic Studies Section, Traffic Studies Unit P.O. Box 1460 Alhambra, CA 91802-1460**

By Fax

	Processing Engineer	Telephone No.	Fax No.	E-Mail Address
	Jeffrey Pletyak	(626) 300-4721	(626) 300-4736	JPlety@dpw.lacounty.gov
	Suen Fei Lau	(626) 300-4820		SFLau@dpw.lacounty.gov
	Andrew Ngumba	(626) 300-4851		ANGUMBA@dpw.lacounty.gov
X	Launda Zako	(626) 300-4792		LZAKO@dpw.lacounty.gov

SFLau 6/17/14

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
APPLICATION FOR ENVIRONMENTAL IMPACT REPORT
TRAFFIC STUDY REVIEW SERVICES, ORDINANCE NO. 91-0101

Road Fund No:	B03	Revenue Source	9254	Program No:	R291

Department Receipt No.:	T4000300	**Date:**	8-8-2014
Project No.:		**Studies No.:**	
Project Name:	Rowland Heights Plaza		
Applicant/Engineer:	Robert Kunzman	**Telephone No.:**	1-714-973-8383
Company:	Kunzman Associates, Inc.	**Fax No.:**	1-714-973-8821
Address:	1111 West Town & Country Road, Suite 34		
City, State:	Orange, CA	**Zip:**	92868

The traffic study (TS), required as part of the environmental review process, has been received. **Before a traffic study review can begin, the indicated fee must be paid to this Department.** The fee may be paid in person or mailed to:

In Person	By Mail
Cashier, Mezzanine Level (626) 458-6399 **Los Angeles County Department of Public Works** **900 South Fremont Avenue** **Alhambra, CA 91803-1331**	**Cashier, Mezzanine Level** **Los Angeles County Department of Public Works** **P.O. Box 1460** **Alhambra, CA 91802-1460**

Please **return this form** along with your payment to insure proper credit to your account. Make check payable to the **Los Angeles County Department of Public Works.**

TS review fees are based on the number of Average Daily Trips (ADT's) generated by the project and for six traffic conditions as indicated on page 5 of our 1997 guidelines, as follows:

ADT's		**FEE (Effective March 1, 2014)*	
1 - 1,000		**$1,713**	
1,001 - 5,000		**$3,475**	
5,001 - 10,000		**$4,882**	
10,001 and over		**$5,138**	
ADT For This Project:	**12,484**	Fee:	**$5,138**

* For additional information, http://planning.lacounty.gov
** Additional fee is required for additional traffic conditions/phases

	Processing Engineer	Telephone No.	Fax No.	E-Mail Address
	Jeffrey Pletyak	(626) 300-4721	(626) 300-4736	JPlety@dpw.lacounty.gov
X	Suen Fei Lau	(626) 300-4820		SFLau@dpw.lacounty.gov
	Andrew Ngumba	(626) 300-4851		ANGUMBA@dpw.lacounty.gov
	Launda Zako	(626) 300-4792		LZAKO@dpw.lacounty.gov

cc: Cashier Note: Normal review time is 6-8 weeks after review fee is paid and receipt is received by Studies Unit.
P:\tlpub\WPFILES\FILES\STU\VL\MOU\LA County MOU 03-01-11 Blank.docx Updated 03/01/11

SFLau 8/7/14

Table 1

Project Trip Generation[1]

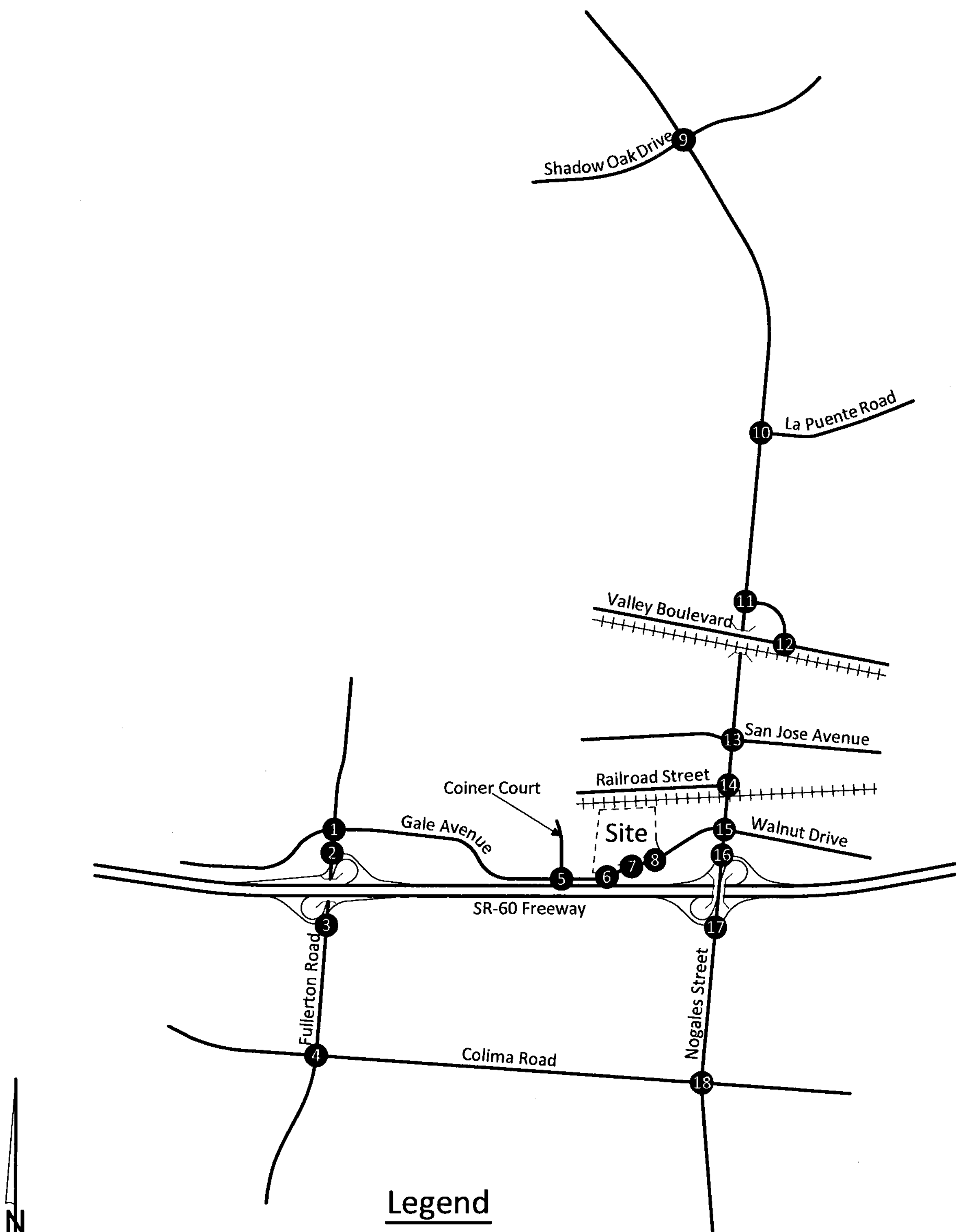
			Weekday							Saturday		
			Peak Hour									
			Morning			Evening				Mid-day		
Land Use	Quantity	Units[2]	Inbound	Outbound	Total	Inbound	Outbound	Total	Daily	Inbound	Outbound	Total
Trip Generation Rates												
Shopping Center		TSF	0.60	0.36	0.96	1.78	1.93	3.71	42.70	2.51	2.31	4.82
High Turnover Sit-Down Restaurant		TSF	5.95	4.86	10.81	5.91	3.94	9.85	127.15	6.05	6.61	12.66
Quality Restaurant		TSF	0.41	0.40	0.81	5.02	2.47	7.49	89.95	6.38	4.44	10.82
Hotel		RM	0.39	0.28	0.67	0.34	0.36	0.70	8.92	0.44	0.43	0.87
Office		TSF	0.42	0.06	0.48	0.08	0.38	0.46	3.32	0.05	0.04	0.09
Trips Generated												
Retail	85.840	TSF	52	31	83	153	166	319	3,665	215	198	413
High Turnover Sit-Down Restaurant	20.990	TSF	125	102	227	124	83	207	2,669	127	139	266
Quality Restaurant	20.990	TSF	9	8	17	105	52	157	1,888	134	93	227
Hotel	477	RM	186	134	320	162	172	334	4,255	210	205	415
Office	2.000	TSF	1	0	1	0	1	1	7	0	0	0
Subtotal			373	275	648	544	474	1,018	12,484	686	635	1,321
Pass-By (10%)			-37	-28	-65	-54	-47	-101	-1,248	-69	-64	-133
Commercial Internal Capture (5%)			-3	-2	-5	-8	-8	-16	-183	-11	-10	-21
Restaurant Internal Capture (10%)			-13	-11	-24	-23	-14	-37	-456	-26	-23	-49
Total			320	234	554	459	405	864	10,597	580	538	1,118

[1]Source: Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012, Land Use Categories 310, 710, 820, and 932.

[2]TSF = Thousand Square Feet; RM = Room

2/17/14

Figure 1
Project Location Map



Legend

1 = Intersection Reference Number

5089b/1

KUNZMAN ASSOCIATES, INC.

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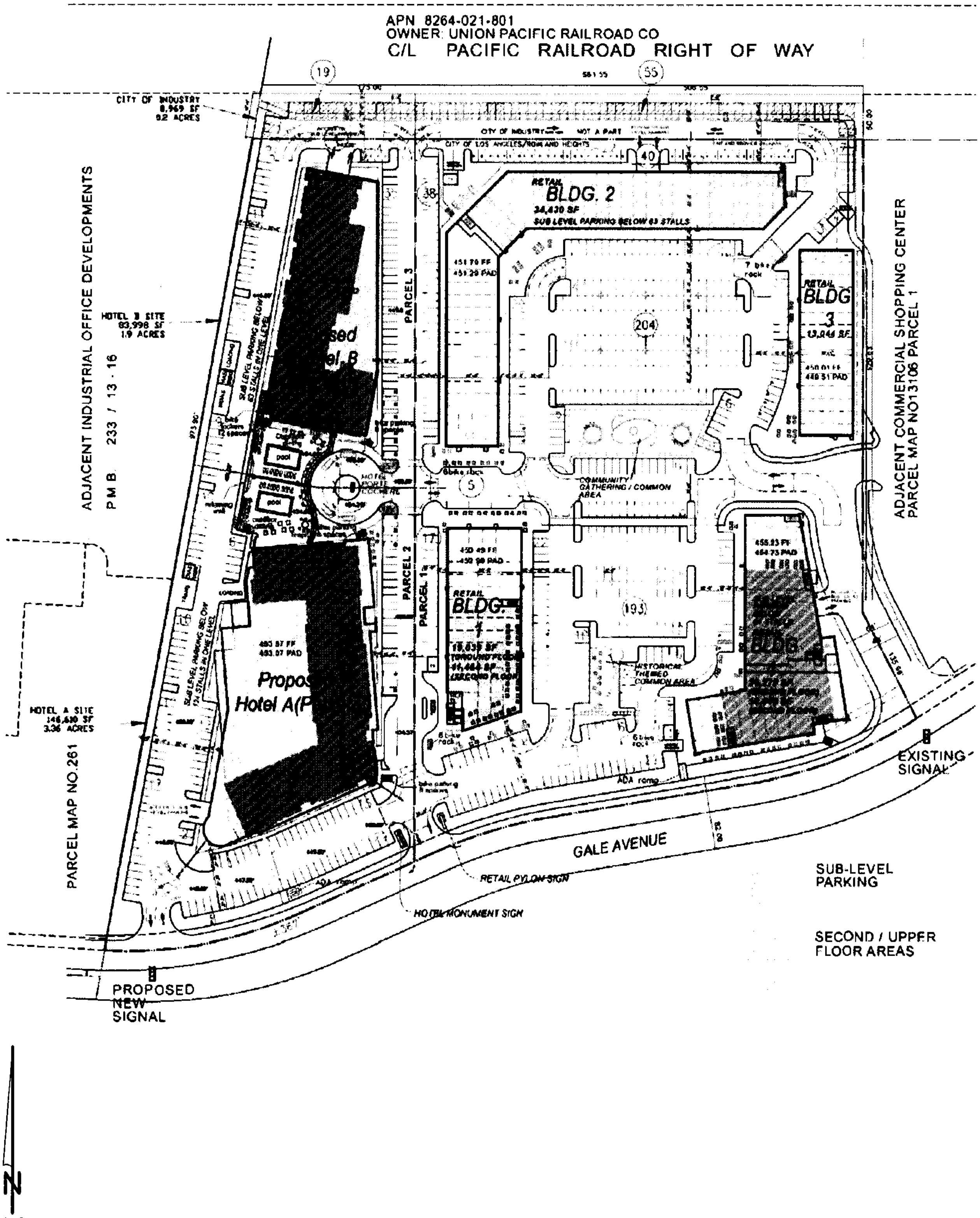
SH 12/17/14

Figure 2
Site Plan

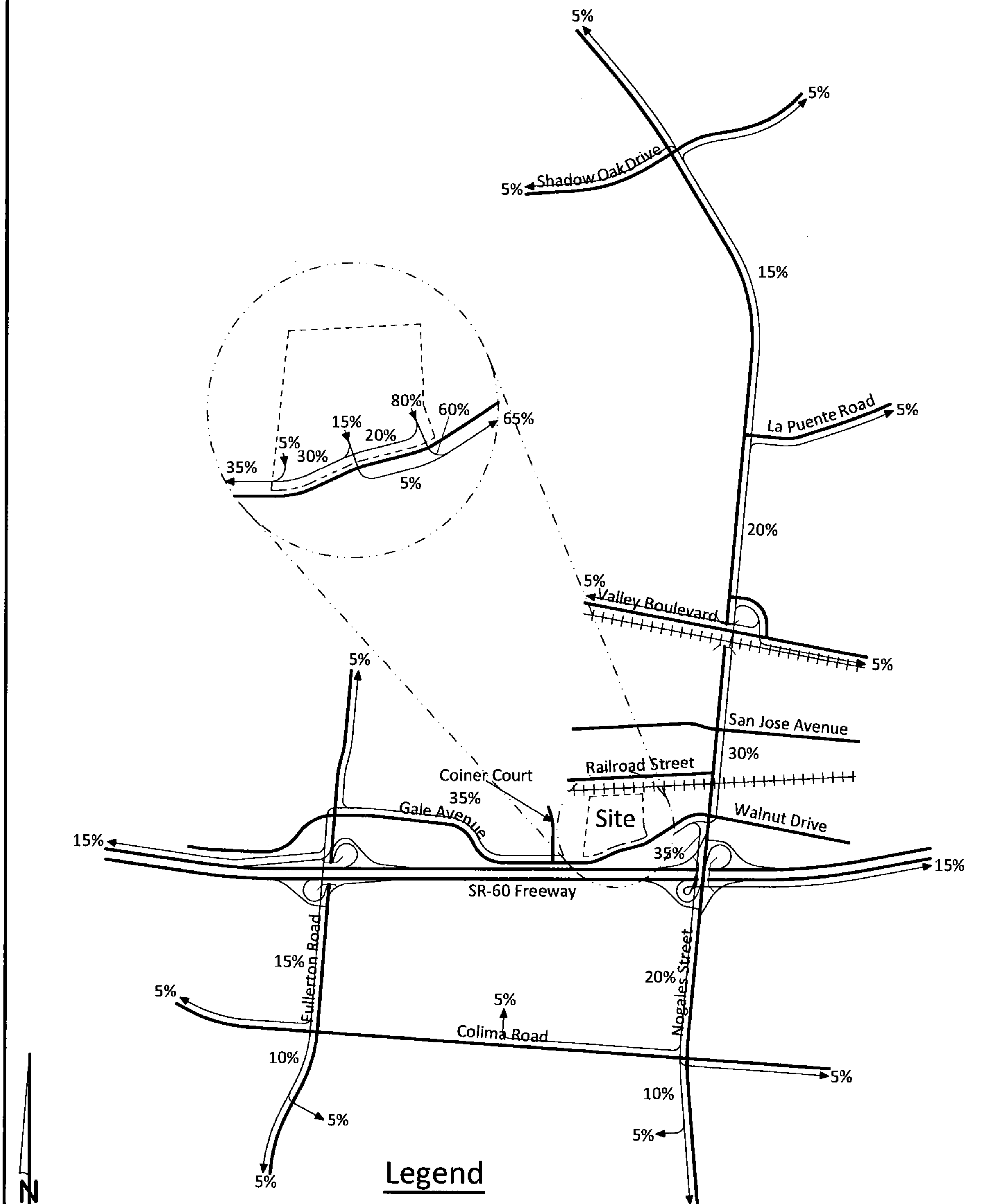


KUNZMAN ASSOCIATES, INC.

5089b/2

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 3
Project Outbound Trip Distribution - Retail



Legend

10% = Percent From Project

5089b/3

Kunzman Associates, Inc.

Over 35 Years of Excellent Service

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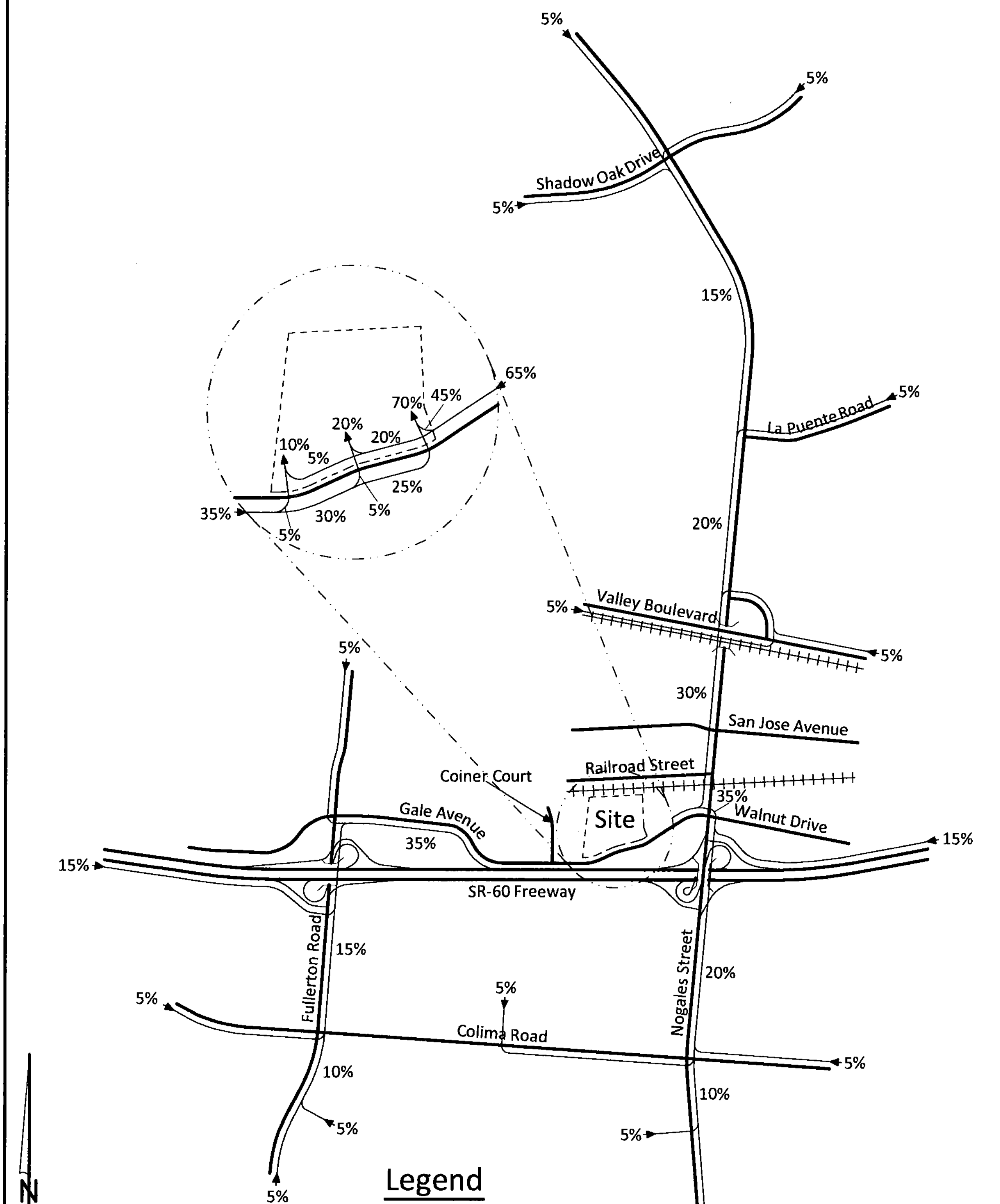
Figure 4
Project Inbound Trip Distribution - Retail



Legend

10% = Percent To Project

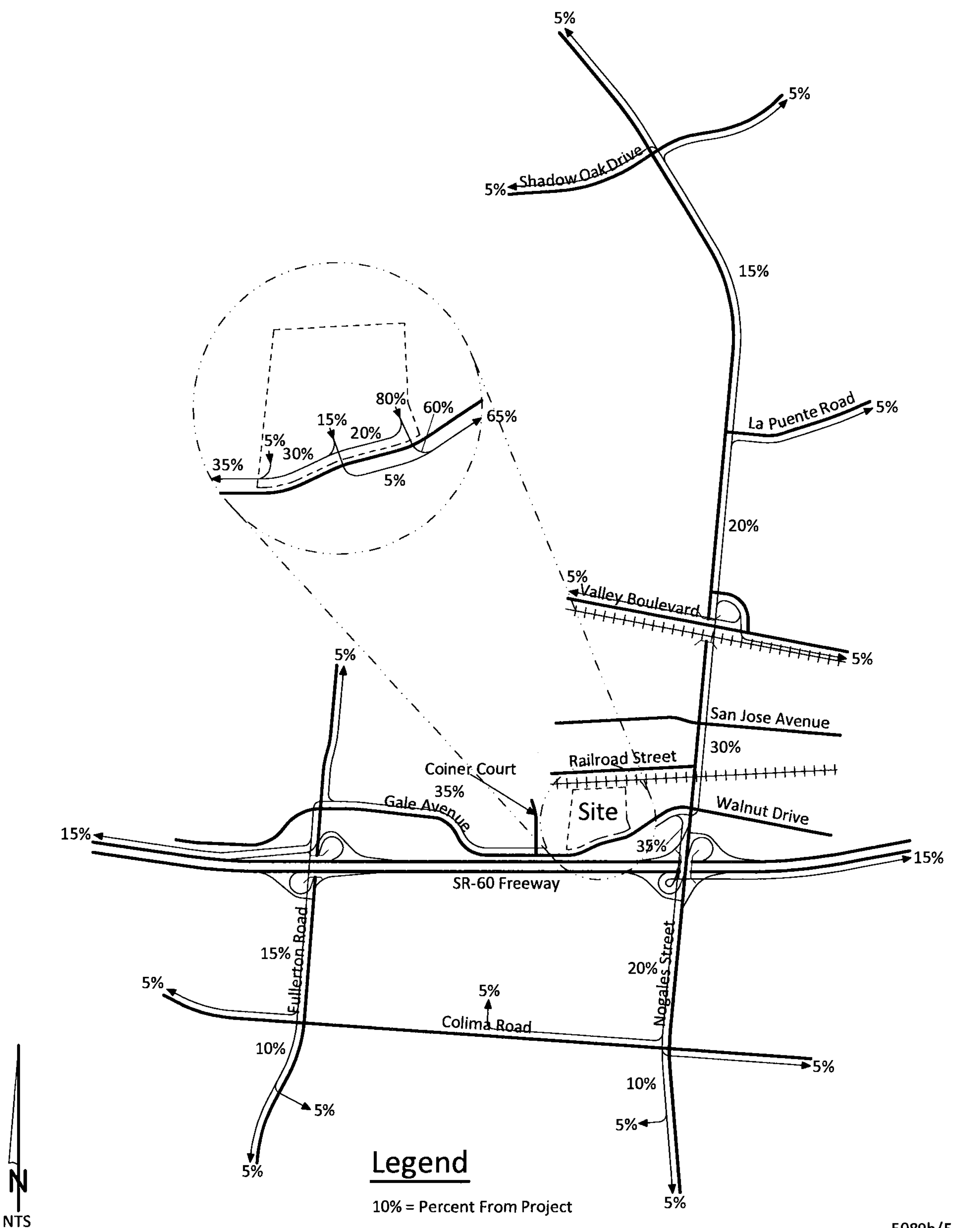
5089b/4

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

[signature] 2/7/14

Figure 5
Project Outbound Trip Distribution - Restaurant



Kunzman Associates, Inc.

Over 35 Years of Excellent Service

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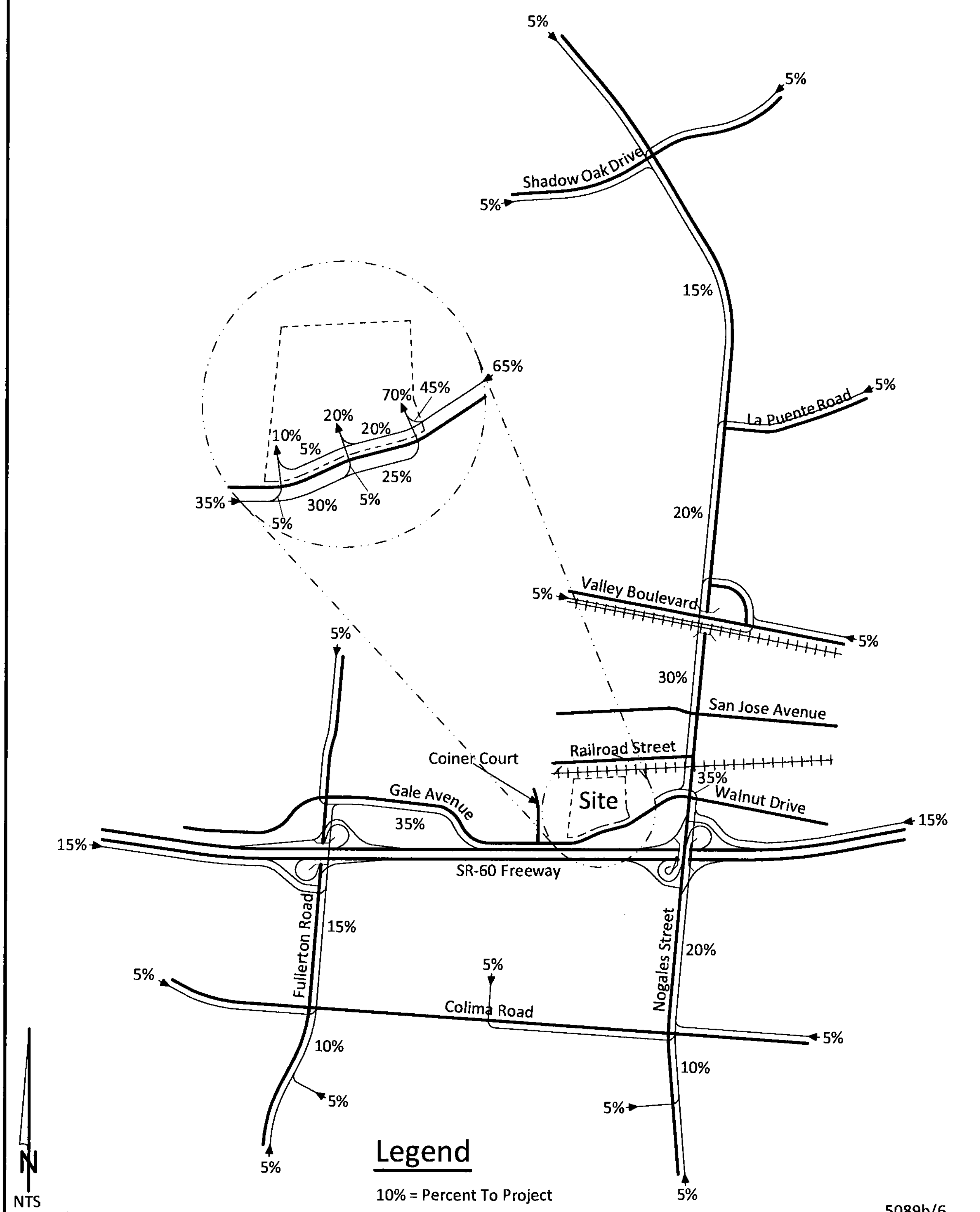
Figure 6
Project Inbound Trip Distribution - Restaurant



KUNZMAN ASSOCIATES, INC.
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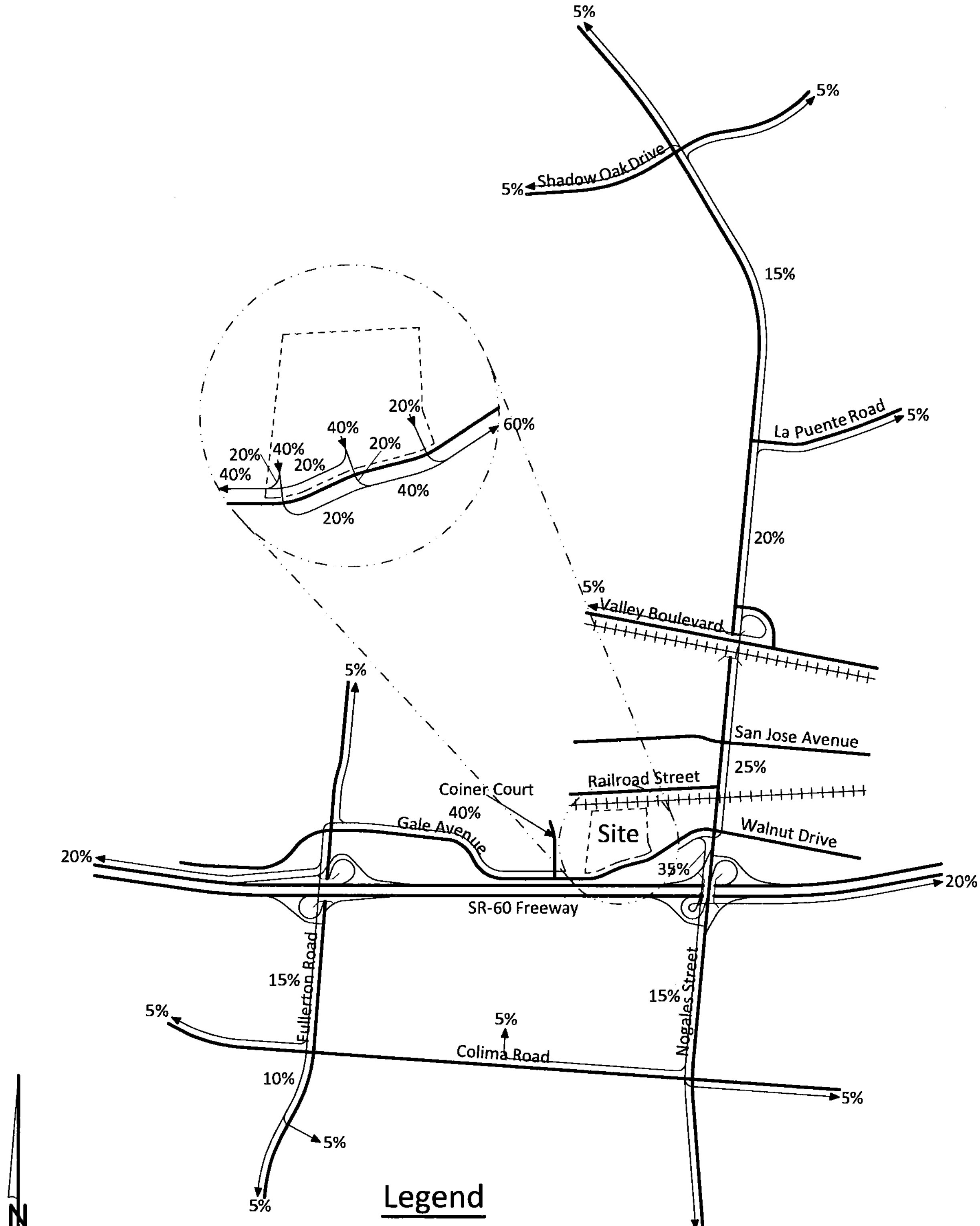
Figure 7
Project Outbound Trip Distribution - Hotel



Legend

10% = Percent From Project

5089b/7

KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

Figure 8
Project Inbound Trip Distribution - Hotel

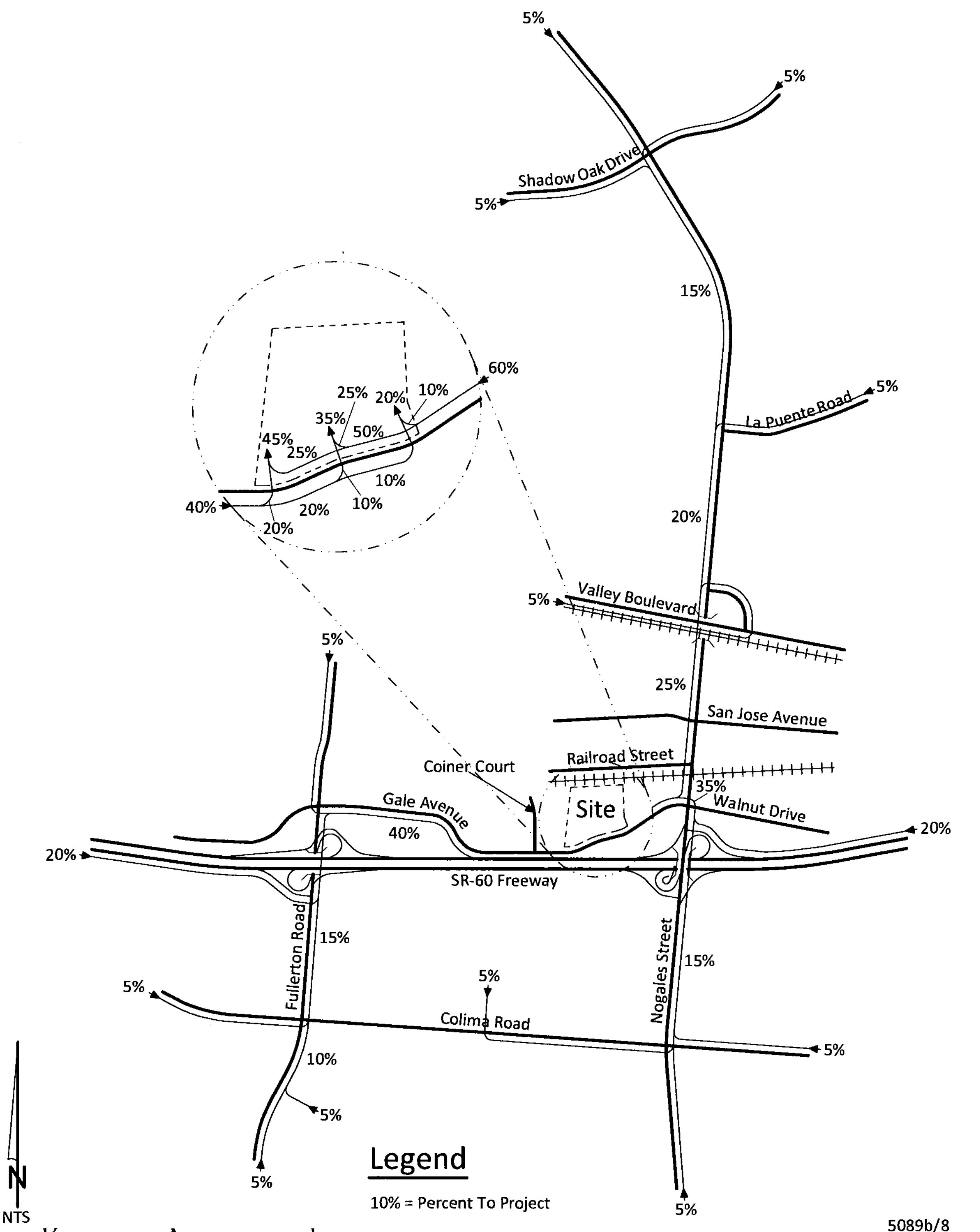


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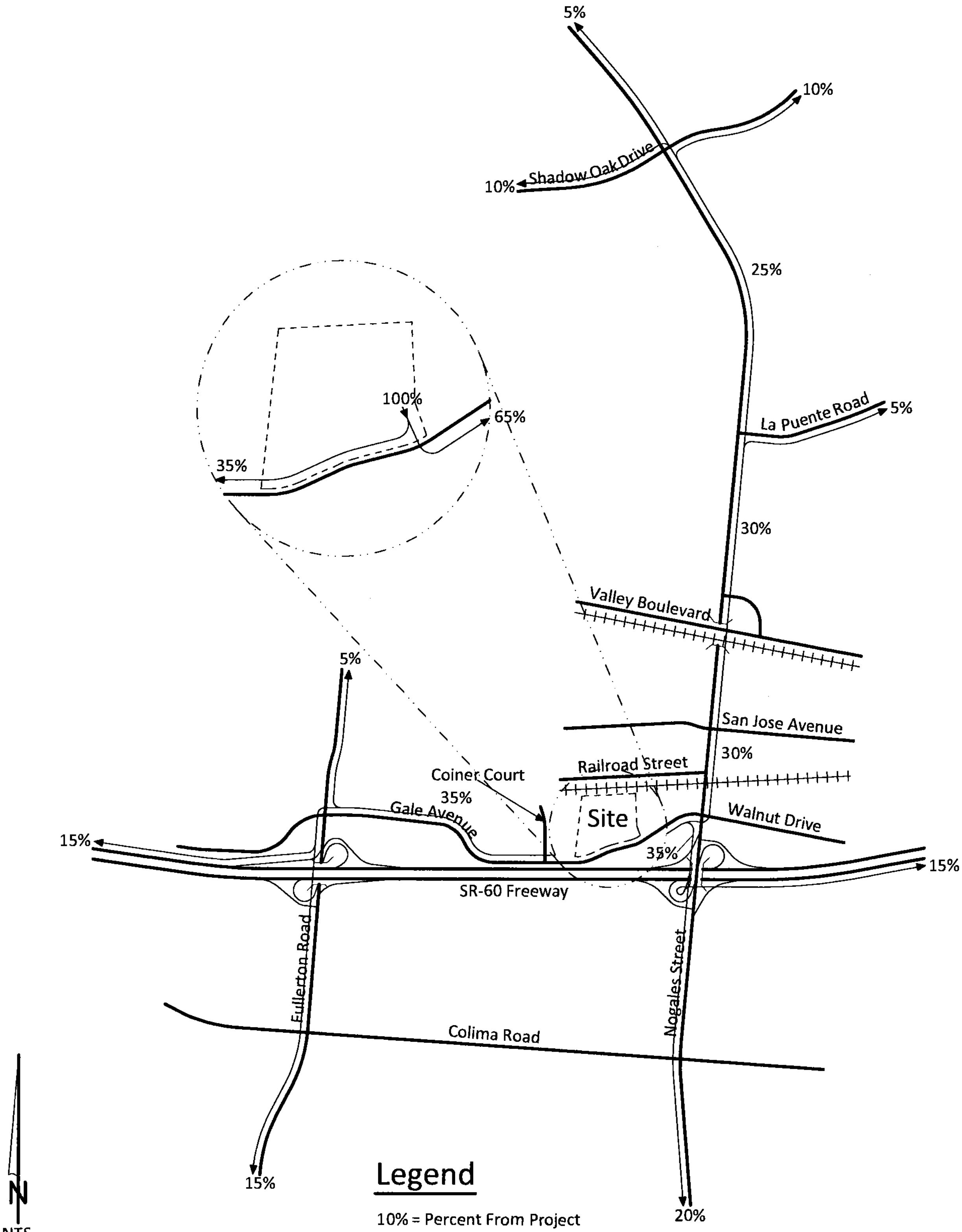
Figure 9
Project Outbound Trip Distribution - Office



Legend

10% = Percent From Project

5089b/9

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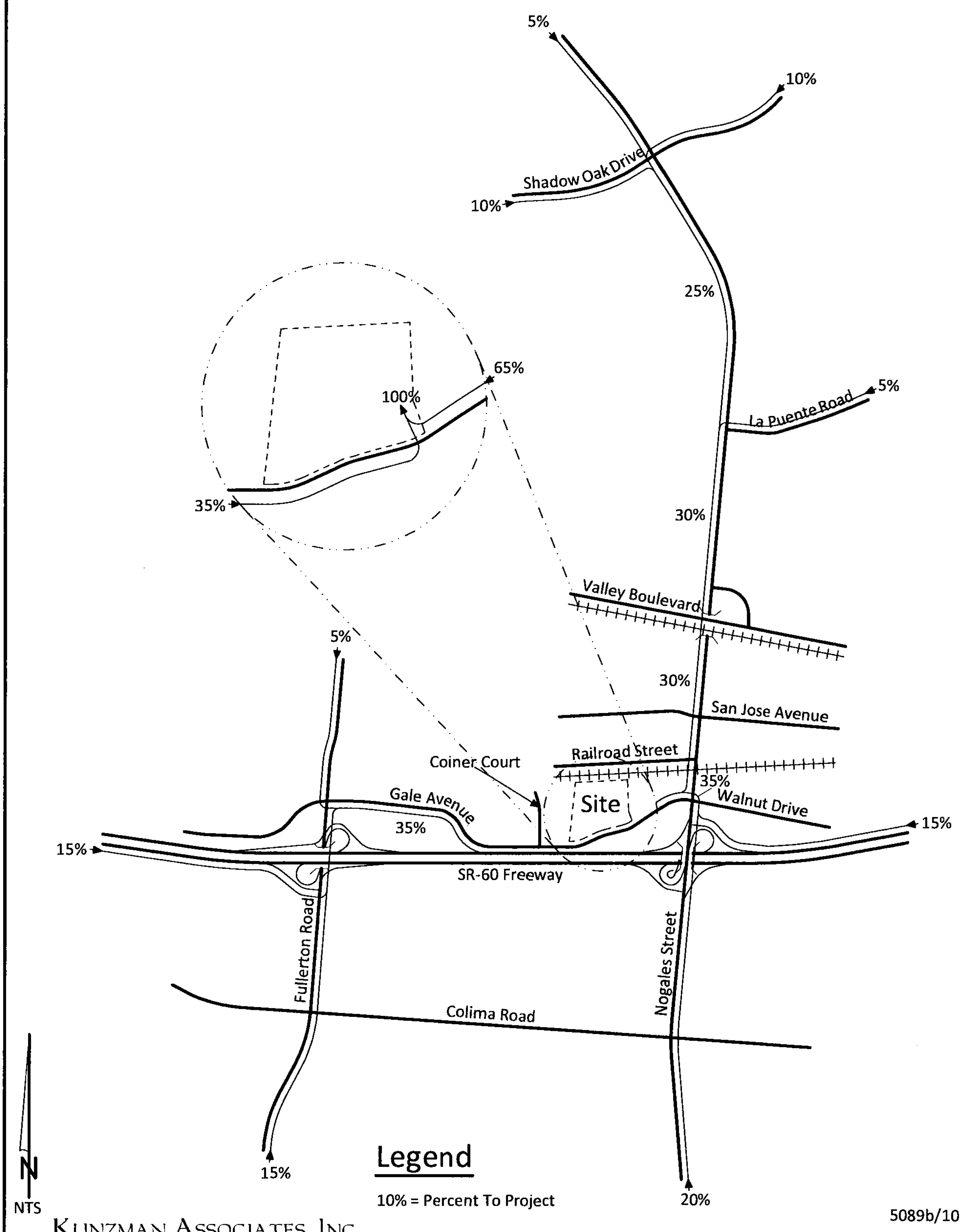
Figure 10
Project Inbound Trip Distribution - Office



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APPENDIX C

Traffic Count Worksheets

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_001 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:	Fullerton Rd			Fullerton Rd			East Gale Ave			East Gale Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	1	1	3	0	1	2	1	1	2	0	
7:00 AM	97	111	7	1	88	13	10	16	29	8	41	3	424
7:15 AM	102	148	9	6	91	23	18	20	43	5	50	9	524
7:30 AM	112	195	24	0	93	24	27	21	41	7	72	3	619
7:45 AM	96	237	36	9	95	25	27	49	36	8	75	4	697
8:00 AM	104	238	57	8	97	29	34	43	42	11	85	8	756
8:15 AM	126	248	46	10	96	45	49	43	47	18	86	13	827
8:30 AM	137	211	43	7	95	36	51	60	49	10	91	5	795
8:45 AM	109	178	40	10	85	37	29	57	48	11	88	14	706

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	883	1566	262	51	740	232	245	309	335	78	588	59	5348
APPROACH %'s :	32.57%	57.76%	9.66%	4.99%	72.34%	22.68%	27.56%	34.76%	37.68%	10.76%	81.10%	8.14%	

PEAK HR START TIME :	800 AM												TOTAL
PEAK HR VOL :	476	875	186	35	373	147	163	203	186	50	350	40	3084
PEAK HR FACTOR :		0.915			0.919			0.863			0.940		0.932

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_001 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Fullerton Rd			Fullerton Rd			East Gale Ave			East Gale Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	1	1	3	0	1	2	1	1	2	0	
4:00 PM	86	119	31	16	116	46	66	119	108	20	81	8	816
4:15 PM	72	132	39	18	125	49	47	103	109	34	66	13	807
4:30 PM	91	133	35	7	128	45	63	128	113	50	90	12	895
4:45 PM	100	130	40	18	127	41	50	123	85	38	72	12	836
5:00 PM	79	136	28	9	114	42	66	123	90	50	103	19	859
5:15 PM	98	139	32	10	86	43	28	103	114	54	81	10	798
5:30 PM	80	139	32	7	75	49	63	134	116	63	121	17	896
5:45 PM	87	144	40	8	109	57	48	106	99	45	70	14	827

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	693	1072	277	93	880	372	431	939	834	354	684	105	6734
APPROACH %'s :	33.94%	52.50%	13.57%	6.91%	65.43%	27.66%	19.56%	42.60%	37.84%	30.97%	59.84%	9.19%	

PEAK HR START TIME :	415 PM												TOTAL
PEAK HR VOL :	342	531	142	52	494	177	226	477	397	172	331	56	3397
PEAK HR FACTOR :		0.940			0.941			0.905			0.813		0.949

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_001 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Fullerton Rd			Fullerton Rd			East Gale Ave			East Gale Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	1	1	3	0	1	2	1	1	2	0	
10:00 AM	143	98	76	7	95	97	43	61	110	39	115	10	894
10:15 AM	149	83	68	15	93	80	35	62	73	31	67	5	761
10:30 AM	116	98	40	5	74	72	46	73	109	51	72	7	763
10:45 AM	132	76	54	6	77	66	47	106	116	34	79	5	798
11:00 AM	139	85	57	9	87	71	58	83	105	51	104	6	855
11:15 AM	155	90	81	10	83	58	55	108	110	44	67	6	867
11:30 AM	128	109	67	11	90	73	55	96	113	33	91	4	870
11:45 AM	166	80	70	11	87	86	48	95	137	43	80	10	913
12:00 PM	138	116	84	14	99	68	61	112	128	54	81	8	963
12:15 PM	148	95	66	9	100	78	62	105	115	32	87	13	910
12:30 PM	140	85	51	12	128	88	64	103	127	47	86	14	945
12:45 PM	142	100	55	10	123	66	57	99	113	40	85	8	898
1:00 PM	114	94	52	4	80	64	63	119	131	49	88	7	865
1:15 PM	154	99	71	8	84	76	51	91	109	35	83	5	866
1:30 PM	108	125	51	3	108	40	49	116	117	45	83	12	857
1:45 PM	166	100	54	3	104	74	54	77	138	40	63	7	880

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	2238	1533	997	137	1512	1157	848	1506	1851	668	1331	127	13905
APPROACH %'s :	46.94%	32.15%	20.91%	4.88%	53.88%	41.23%	20.17%	35.81%	44.02%	31.42%	62.61%	5.97%	

PEAK HR START TIME :	1145 AM												TOTAL
PEAK HR VOL :	592	376	271	46	414	320	235	415	507	176	334	45	3731
PEAK HR FACTOR :		0.916			0.855			0.961			0.944		0.969

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_002 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:	Fullerton Rd			Fullerton Rd			SR-60 Freeway WB Ramps			SR-60 Freeway WB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	0	3	0	0	0	0	1.5	0	1.5	
7:00 AM		129	101		124					85		87	526
7:15 AM		166	87		139					85		93	570
7:30 AM		202	81		140					104		128	655
7:45 AM		248	76		139					74		121	658
8:00 AM		253	92		151					90		145	731
8:15 AM		252	83		160					109		167	771
8:30 AM		251	72		154					118		140	735
8:45 AM		219	72		144					100		109	644
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	1720	664	0	1151	0	0	0	0	765	0	990	5290
APPROACH %'s :	0.00%	72.15%	27.85%	0.00%	100.00%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	43.59%	0.00%	56.41%	
PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	0	1004	323	0	604	0	0	0	0	391	0	573	2895
PEAK HR FACTOR :		0.962			0.944			0.000			0.873		0.939

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_002 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Fullerton Rd			Fullerton Rd			SR-60 Freeway WB Ramps			SR-60 Freeway WB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	0	3	0	0	0	0	1.5	0	1.5	
4:00 PM		146	107		242					94		88	677
4:15 PM		178	119		268					87		64	716
4:30 PM		175	106		291					82		85	739
4:45 PM		188	147		250					95		81	761
5:00 PM		162	142		253					95		83	735
5:15 PM		184	137		255					96		85	757
5:30 PM		182	135		254					88		68	727
5:45 PM		180	111		253					111		91	746

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	1395	1004	0	2066	0	0	0	0	748	0	645	5858
APPROACH %'s :	0.00%	58.15%	41.85%	0.00%	100.00%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	53.70%	0.00%	46.30%	

PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	0	709	532	0	1049	0	0	0	0	368	0	334	2992
PEAK HR FACTOR :		0.926			0.901			0.000			0.970		0.983

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_002 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Fullerton Rd			Fullerton Rd			SR-60 Freeway WB Ramps			SR-60 Freeway WB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	1	0	3	0	0	0	0	1.5	0	1.5	
10:00 AM		195	146		243					145		121	850
10:15 AM		172	158		197					104		126	757
10:30 AM		155	126		234					122		99	736
10:45 AM		144	140		227					86		117	714
11:00 AM		143	125		243					93		139	743
11:15 AM		207	106		237					114		119	783
11:30 AM		186	128		235					123		120	792
11:45 AM		193	157		267					125		121	863
12:00 PM		195	131		280					156		144	906
12:15 PM		193	149		248					126		117	833
12:30 PM		163	142		302					142		112	861
12:45 PM		181	155		276					110		117	839
1:00 PM		158	136		259					129		102	784
1:15 PM		208	135		228					132		118	821
1:30 PM		167	147		271					110		119	814
1:45 PM		199	121		282					128		120	850

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	2859	2202	0	4029	0	0	0	0	1945	0	1911	12946
APPROACH %'s :	0.00%	56.49%	43.51%	0.00%	100.00%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	50.44%	0.00%	49.56%	

PEAK HR START TIME :	1145 AM												TOTAL
PEAK HR VOL :	0	744	579	0	1097	0	0	0	0	549	0	494	3463
PEAK HR FACTOR :		0.945			0.908			0.000			0.869		0.956

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_003 | **Day:** TUESDAY

City: City of Industry | **Date:** 4/16/2013

AM

NS/EW Streets:	Fullerton Rd			Fullerton Rd			SR-60 Freeway EB Ramps			SR-60 Freeway EB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	0	1	2	1	1.5	0.5	1	1	0	1	
7:00 AM		281	3	1	139	49	41	3	108	1		1	627
7:15 AM		314	3	2	164	46	45	2	173	3		4	756
7:30 AM		351	3	3	167	54	73	2	138	2		2	795
7:45 AM		353	5	0	152	38	94	1	165	1		4	813
8:00 AM		314	3	4	163	56	112	6	139	2		7	806
8:15 AM		304	1	3	183	60	107	1	119	1		5	784
8:30 AM		307	6	5	186	63	97	2	129	1		2	798
8:45 AM		260	6	5	152	63	110	5	102	5		2	710
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	2484	30	23	1306	429	679	22	1073	16	0	27	6089
APPROACH %'s :	0.00%	98.81%	1.19%	1.31%	74.29%	24.40%	38.28%	1.24%	60.48%	37.21%	0.00%	62.79%	
PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	0	1278	15	12	684	217	410	10	552	5	0	18	3201
PEAK HR FACTOR :		0.903			0.899			0.935			0.639		0.984

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_003 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Fullerton Rd			Fullerton Rd			SR-60 Freeway EB Ramps			SR-60 Freeway EB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	0	1	2	1	1.5	0.5	1	1	0	1	
4:00 PM		253	15	8	202	70	58	6	96	15		10	733
4:15 PM		314	10	18	209	79	46	5	136	7		17	841
4:30 PM		290	9	8	200	84	57	5	129	10		15	807
4:45 PM		333	5	9	225	60	56	5	139	8		13	853
5:00 PM		322	12	9	200	42	42	2	134	6		12	781
5:15 PM		358	6	14	220	45	36	7	103	12		7	808
5:30 PM		306	12	13	175	40	57	8	153	10		14	788
5:45 PM		298	10	11	210	73	51	5	143	8		14	823
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	2474	79	90	1641	493	403	43	1033	76	0	102	6434
APPROACH %'s :	0.00%	96.91%	3.09%	4.05%	73.79%	22.17%	27.25%	2.91%	69.84%	42.70%	0.00%	57.30%	
PEAK HR START TIME :	415 PM												TOTAL
PEAK HR VOL :	0	1259	36	44	834	265	201	17	538	31	0	57	3282
PEAK HR FACTOR :		0.958			0.934			0.945			0.880		0.962

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_003 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Fullerton Rd			Fullerton Rd			SR-60 Freeway EB Ramps			SR-60 Freeway EB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	0	1	2	1	1.5	0.5	1	1	0	1	
10:00 AM		346	19	28	216	93	72	8	124	9		10	925
10:15 AM		350	18	23	174	64	52	12	125	8		11	837
10:30 AM		327	17	22	208	76	47	7	83	9		12	808
10:45 AM		341	16	18	157	85	39	8	103	13		20	800
11:00 AM		306	23	10	199	91	48	13	113	4		24	831
11:15 AM		340	20	38	179	92	59	7	128	14		20	897
11:30 AM		360	8	36	197	83	73	20	141	12		21	951
11:45 AM		380	25	31	217	91	56	11	153	8		36	1008
12:00 PM		337	12	24	243	102	70	19	132	10		29	978
12:15 PM		355	23	31	197	86	74	13	139	22		31	971
12:30 PM		341	21	35	260	94	55	23	143	20		35	1027
12:45 PM		390	26	26	213	105	52	9	139	21		25	1006
1:00 PM		295	17	30	210	91	52	36	148	19		40	938
1:15 PM		383	19	34	188	85	72	9	139	9		38	976
1:30 PM		374	18	18	234	81	50	13	140	16		34	978
1:45 PM		366	20	34	196	112	52	13	131	17		42	983

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	5591	302	438	3288	1431	923	221	2081	211	0	428	14914
APPROACH %'s :	0.00%	94.88%	5.12%	8.49%	63.76%	27.75%	28.62%	6.85%	64.53%	33.02%	0.00%	66.98%	

PEAK HR START TIME :	1145 AM												TOTAL
PEAK HR VOL :	0	1413	81	121	917	373	255	66	567	60	0	131	3984
PEAK HR FACTOR :		0.922			0.907			0.982			0.868		0.970

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_004 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:	Fullerton Rd			Fullerton Rd			Colima Rd			Colima Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	0	2	2	0	2	3	0	2	3	0	
7:00 AM	36	188	17	26	211	23	18	39	29	22	98	52	759
7:15 AM	39	190	18	33	245	15	24	54	35	34	115	61	863
7:30 AM	47	194	26	44	277	28	28	79	45	19	119	68	974
7:45 AM	63	194	17	50	225	18	20	96	44	47	158	64	996
8:00 AM	61	199	22	54	213	24	20	90	40	39	165	82	1009
8:15 AM	72	190	15	34	182	41	29	105	31	51	234	61	1045
8:30 AM	95	188	14	60	221	68	26	77	29	42	182	57	1059
8:45 AM	84	180	15	40	138	51	29	110	27	36	178	71	959

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	497	1523	144	341	1712	268	194	650	280	290	1249	516	7664
APPROACH %'s :	22.97%	70.38%	6.65%	14.69%	73.76%	11.55%	17.26%	57.83%	24.91%	14.11%	60.78%	25.11%	

PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	291	771	68	198	841	151	95	368	144	179	739	264	4109
PEAK HR FACTOR :		0.951			0.852			0.920			0.854		0.970

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_004 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Fullerton Rd			Fullerton Rd			Colima Rd			Colima Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	0	2	2	0	2	3	0	2	3	0	
4:00 PM	56	139	30	82	158	34	39	208	34	42	149	45	1016
4:15 PM	76	168	25	83	186	29	50	250	38	36	155	50	1146
4:30 PM	68	211	22	109	217	36	46	234	26	41	171	42	1223
4:45 PM	43	148	23	76	170	24	22	232	21	37	120	32	948
5:00 PM	59	184	19	104	189	49	40	239	43	37	170	65	1198
5:15 PM	73	193	18	88	174	37	51	290	29	59	193	45	1250
5:30 PM	73	173	26	111	215	34	42	213	39	46	163	51	1186
5:45 PM	62	156	22	97	177	31	39	287	33	67	194	52	1217

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	510	1372	185	750	1486	274	329	1953	263	365	1315	382	9184
APPROACH %'s :	24.67%	66.38%	8.95%	29.88%	59.20%	10.92%	12.93%	76.74%	10.33%	17.70%	63.77%	18.53%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	267	706	85	400	755	151	172	1029	144	209	720	213	4851
PEAK HR FACTOR :		0.931			0.907			0.909			0.912		0.970

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_004 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Fullerton Rd			Fullerton Rd			Colima Rd			Colima Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	0	2	2	0	2	3	0	2	3	0	
10:00 AM	48	142	27	117	151	56	43	144	28	41	322	98	1217
10:15 AM	55	153	17	98	137	53	46	172	28	37	248	83	1127
10:30 AM	71	121	26	71	127	66	53	165	32	51	224	96	1103
10:45 AM	67	137	36	72	106	54	69	235	39	29	236	76	1156
11:00 AM	59	160	29	79	135	54	55	174	40	51	180	65	1081
11:15 AM	51	164	21	98	138	56	64	232	43	49	262	75	1253
11:30 AM	62	174	19	104	149	64	57	214	30	50	209	77	1209
11:45 AM	72	147	25	72	148	71	75	244	34	47	235	79	1249
12:00 PM	62	150	45	65	176	62	58	219	37	65	250	75	1264
12:15 PM	67	134	36	89	155	73	56	232	45	40	254	77	1258
12:30 PM	71	135	31	89	155	76	59	223	33	63	250	75	1260
12:45 PM	55	138	19	112	160	73	61	248	51	54	224	78	1273
1:00 PM	87	134	25	91	138	44	78	233	43	54	241	74	1242
1:15 PM	67	125	26	105	157	70	65	247	35	49	257	85	1288
1:30 PM	68	151	24	79	169	63	54	204	35	42	284	70	1243
1:45 PM	63	149	18	102	176	60	71	206	52	43	252	69	1261

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1025	2314	424	1443	2377	995	964	3392	605	765	3928	1252	19484
APPROACH %'s :	27.24%	61.49%	11.27%	29.97%	49.37%	20.66%	19.43%	68.37%	12.20%	12.87%	66.07%	21.06%	

PEAK HR START TIME :	1230 PM												TOTAL
PEAK HR VOL :	280	532	101	397	610	263	263	951	162	220	972	312	5063
PEAK HR FACTOR :		0.928			0.920			0.956			0.962		0.983

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_005 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:	Coiner Court			Coiner Court			East Gale Ave			East Gale Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	1	0	1	2	0	0	2	0	
7:00 AM				0		0	1	13			47	4	65
7:15 AM				0		1	0	25			68	1	95
7:30 AM				0		0	1	22			87	7	117
7:45 AM				1		0	5	46			108	6	166
8:00 AM				2		0	9	36			126	13	186
8:15 AM				1		1	11	36			123	10	182
8:30 AM				3		2	11	35			133	14	198
8:45 AM				6		1	15	51			118	27	218

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	13	0	5	53	264	0	0	810	82	1227
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	72.22%	0.00%	27.78%	16.72%	83.28%	0.00%	0.00%	90.81%	9.19%	

PEAK HR START TIME :	800 AM												TOTAL
PEAK HR VOL :	0	0	0	12	0	4	46	158	0	0	500	64	784
PEAK HR FACTOR :		0.000			0.571			0.773			0.959		0.899

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_005 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Coiner Court			Coiner Court			East Gale Ave			East Gale Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	1	0	1	2	0	0	2	0	
4:00 PM				18		12	10	154			83	8	285
4:15 PM				13		10	6	146			101	11	287
4:30 PM				13		13	5	173			91	6	301
4:45 PM				15		9	6	146			91	13	280
5:00 PM				27		15	5	191			104	5	347
5:15 PM				20		8	3	154			93	5	283
5:30 PM				50		18	2	188			97	7	362
5:45 PM				20		6	3	160			96	5	290

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	176	0	91	40	1312	0	0	756	60	2435
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	65.92%	0.00%	34.08%	2.96%	97.04%	0.00%	0.00%	92.65%	7.35%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	0	0	117	0	47	13	693	0	0	390	22	1282
PEAK HR FACTOR :		0.000			0.603			0.901			0.945		0.885

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_005 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Coiner Court			Coiner Court			East Gale Ave			East Gale Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	1	0	1	2	0	0	2	0	
10:00 AM				3		2	3	107			127	6	248
10:15 AM				4		2	3	115			115	3	242
10:30 AM				4		1	4	99			116	6	230
10:45 AM				11		2	5	115			121	4	258
11:00 AM				3		4	1	115			135	2	260
11:15 AM				5		5	6	139			115	6	276
11:30 AM				7		3	4	134			120	5	273
11:45 AM				4		6	5	126			107	7	255
12:00 PM				7		2	3	165			106	2	285
12:15 PM				8		4	3	151			115	4	285
12:30 PM				5		4	6	141			117	5	278
12:45 PM				4		9	4	164			133	6	320
1:00 PM				7		7	6	159			132	4	315
1:15 PM				4		0	6	159			104	2	275
1:30 PM				2		2	1	173			113	2	293
1:45 PM				1		3	8	140			100	6	258

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	79	0	56	68	2202	0	0	1876	70	4351
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	58.52%	0.00%	41.48%	3.00%	97.00%	0.00%	0.00%	96.40%	3.60%	

PEAK HR START TIME :	1245 PM												TOTAL
PEAK HR VOL :	0	0	0	17	0	18	17	655	0	0	482	14	1203
PEAK HR FACTOR :		0.000			0.625			0.966			0.892		0.940

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_006 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:	Best Western Central Access			Best Western Central Access			East Gale Ave			East Gale Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	0	0	0	1	0	0	1	0	
7:00 AM	2		0					13	0	0	51		66
7:15 AM	0		0					23	0	0	69		92
7:30 AM	2		0					25	0	0	95		122
7:45 AM	2		0					43	0	0	115		160
8:00 AM	0		1					39	2	1	143		186
8:15 AM	0		0					36	0	1	147		184
8:30 AM	1		3					33	1	2	155		195
8:45 AM	2		4					51	1	0	150		208

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	9	0	8	0	0	0	0	263	4	4	925	0	1213
APPROACH %'s :	52.94%	0.00%	47.06%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	98.50%	1.50%	0.43%	99.57%	0.00%	

PEAK HR START TIME :	800 AM												TOTAL
PEAK HR VOL :	3	0	8	0	0	0	0	159	4	4	595	0	773
PEAK HR FACTOR :		0.458			0.000			0.784			0.954		0.929

CONTROL : No Control

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_006 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Best Western Central Access			Best Western Central Access			East Gale Ave			East Gale Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	0	0	0	1	0	0	1	0	
4:00 PM	2		0					181	0	0	91		274
4:15 PM	0		0					150	0	0	115		265
4:30 PM	1		1					197	0	0	96		295
4:45 PM	0		1					160	1	3	107		272
5:00 PM	2		2					219	0	1	110		334
5:15 PM	2		1					172	0	0	99		274
5:30 PM	2		1					232	0	1	103		339
5:45 PM	1		2					177	0	1	100		281

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	10	0	8	0	0	0	0	1488	1	6	821	0	2334
APPROACH %'s :	55.56%	0.00%	44.44%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	99.93%	0.07%	0.73%	99.27%	0.00%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	7	0	6	0	0	0	0	800	0	3	412	0	1228
PEAK HR FACTOR :		0.813			0.000			0.862			0.935		0.906

CONTROL : No Control

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_006 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Best Western Central Access			Best Western Central Access			East Gale Ave			East Gale Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	0	0	0	1	0	0	1	0	
10:00 AM	0		1					109	2	0	142		254
10:15 AM	2		1					112	0	1	118		234
10:30 AM	2		0					106	0	1	124		233
10:45 AM	3		0					126	0	0	127		256
11:00 AM	2		0					119	0	0	134		255
11:15 AM	0		0					137	0	0	124		261
11:30 AM	1		0					148	2	0	131		282
11:45 AM	0		0					126	0	1	112		239
12:00 PM	2		2					176	0	2	108		290
12:15 PM	1		1					154	1	1	112		270
12:30 PM	1		0					145	0	2	117		265
12:45 PM	0		0					159	0	3	142		304
1:00 PM	2		2					171	0	3	136		314
1:15 PM	0		1					160	1	1	110		273
1:30 PM	2		2					175	2	2	120		303
1:45 PM	1		0					119	4	0	106		230

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	19	0	10	0	0	0	0	2242	12	17	1963	0	4263
APPROACH %'s :	65.52%	0.00%	34.48%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	99.47%	0.53%	0.86%	99.14%	0.00%	

PEAK HR START TIME :	1245 PM												TOTAL
PEAK HR VOL :	4	0	5	0	0	0	0	665	3	9	508	0	1194
PEAK HR FACTOR :		0.563			0.000			0.944			0.891		0.951

CONTROL : No Control

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_007 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:	Nogales St			Nogales St			Shadow Oak Dr			Shadow Oak Dr			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
7:00 AM	18	97	11	4	127	5	13	7	28	37	15	8	370
7:15 AM	20	150	14	4	160	6	9	16	55	25	7	10	476
7:30 AM	24	209	19	3	218	5	8	7	91	46	10	16	656
7:45 AM	47	197	36	9	140	5	18	33	44	32	18	14	593
8:00 AM	39	186	37	20	136	12	12	31	34	55	24	25	611
8:15 AM	24	149	34	13	187	6	14	30	25	55	45	41	623
8:30 AM	26	133	16	3	148	5	9	1	31	38	22	19	451
8:45 AM	27	120	7	5	138	5	7	4	33	29	13	9	397

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	225	1241	174	61	1254	49	90	129	341	317	154	142	4177
APPROACH %'s :	13.72%	75.67%	10.61%	4.47%	91.94%	3.59%	16.07%	23.04%	60.89%	51.71%	25.12%	23.16%	

PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	134	741	126	45	681	28	52	101	194	188	97	96	2483
PEAK HR FACTOR :		0.894			0.834			0.818			0.676		0.946

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_007 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Nogales St			Nogales St			Shadow Oak Dr			Shadow Oak Dr			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
4:00 PM	23	170	25	9	145	7	5	7	30	10	4	8	443
4:15 PM	26	174	38	5	165	3	5	14	29	14	8	6	487
4:30 PM	23	187	32	12	152	16	12	2	23	15	2	10	486
4:45 PM	26	168	33	3	168	7	7	11	34	13	9	6	485
5:00 PM	36	202	23	6	147	8	9	12	22	17	11	8	501
5:15 PM	31	225	37	7	181	11	9	11	25	14	7	4	562
5:30 PM	40	199	30	8	169	13	8	12	25	30	15	12	561
5:45 PM	27	188	48	20	165	19	12	26	30	16	12	7	570

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	232	1513	266	70	1292	84	67	95	218	129	68	61	4095
APPROACH %'s :	11.54%	75.24%	13.23%	4.84%	89.35%	5.81%	17.63%	25.00%	57.37%	50.00%	26.36%	23.64%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	134	814	138	41	662	51	38	61	102	77	45	31	2194
PEAK HR FACTOR :		0.927			0.924			0.739			0.671		0.962

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_007 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Nogales St			Nogales St			Shadow Oak Dr			Shadow Oak Dr			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
10:00 AM	16	152	19	7	146	4	7	9	43	24	4	14	445
10:15 AM	15	151	15	4	142	6	8	7	43	29	2	5	427
10:30 AM	26	155	22	6	133	5	8	6	36	35	7	16	455
10:45 AM	24	156	22	4	149	9	11	5	35	23	4	10	452
11:00 AM	21	185	27	7	118	7	8	8	33	37	7	9	467
11:15 AM	29	159	10	2	150	9	5	3	41	26	7	8	449
11:30 AM	32	172	17	8	153	6	10	10	33	20	9	8	478
11:45 AM	27	168	16	8	144	10	8	11	45	17	3	6	463
12:00 PM	22	171	23	5	154	10	15	6	36	27	4	6	479
12:15 PM	22	176	20	5	178	8	8	4	39	16	4	7	487
12:30 PM	36	185	24	7	150	10	7	5	32	24	4	15	499
12:45 PM	26	171	24	1	182	10	7	8	29	19	8	2	487
1:00 PM	23	173	23	9	150	7	12	6	27	21	6	10	467
1:15 PM	30	160	20	6	165	9	9	4	31	16	9	11	470
1:30 PM	20	193	25	8	139	11	8	8	16	22	8	9	467
1:45 PM	22	193	20	4	136	4	11	5	22	12	5	9	443

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	391	2720	327	91	2389	125	142	105	541	368	91	145	7435
APPROACH %'s :	11.37%	79.12%	9.51%	3.49%	91.71%	4.80%	18.02%	13.32%	68.65%	60.93%	15.07%	24.01%	

PEAK HR START TIME :	1200 PM												TOTAL
PEAK HR VOL :	106	703	91	18	664	38	37	23	136	86	20	30	1952
PEAK HR FACTOR :		0.918			0.933			0.860			0.791		0.978

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_008 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:	Nogales St			Nogales St			La Puente Rd			La Puente Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	0	0	1	0	0.5	0.5	1	
7:00 AM	3	81	15	35	180	22	11	2	5	40	7	22	423
7:15 AM	3	99	44	40	196	48	26	11	5	45	11	28	556
7:30 AM	24	152	42	31	240	65	38	20	11	67	29	44	763
7:45 AM	8	167	29	28	254	48	47	20	23	75	7	46	752
8:00 AM	0	188	43	30	240	4	5	1	2	62	2	39	616
8:15 AM	0	125	33	37	257	1	1	0	0	76	1	34	565
8:30 AM	0	141	32	33	216	0	0	0	0	70	0	33	525
8:45 AM	0	97	17	34	202	0	0	0	0	77	0	30	457

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	38	1050	255	268	1785	188	128	54	46	512	57	276	4657
APPROACH %'s :	2.83%	78.18%	18.99%	11.96%	79.65%	8.39%	56.14%	23.68%	20.18%	60.59%	6.75%	32.66%	

PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	32	632	147	126	991	118	91	41	36	280	39	163	2696
PEAK HR FACTOR :		0.878			0.919			0.467			0.861		0.883

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_008 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Nogales St			Nogales St			La Puente Rd			La Puente Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	0	0	1	0	0.5	0.5	1	
4:00 PM	2	228	74	42	142	10	7	9	0	52	0	25	591
4:15 PM	1	177	66	37	145	0	6	4	4	47	0	40	527
4:30 PM	1	235	96	46	156	7	4	3	1	55	0	26	630
4:45 PM	2	193	75	47	129	7	6	4	4	51	5	37	560
5:00 PM	0	211	78	59	145	19	28	14	8	55	7	43	667
5:15 PM	1	257	104	37	134	11	17	10	7	47	3	40	668
5:30 PM	0	232	114	58	156	8	14	5	1	63	2	45	698
5:45 PM	1	266	95	52	162	7	10	4	1	60	8	30	696

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	8	1799	702	378	1169	69	92	53	26	430	25	286	5037
APPROACH %'s :	0.32%	71.70%	27.98%	23.39%	72.34%	4.27%	53.80%	30.99%	15.20%	58.03%	3.37%	38.60%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	2	966	391	206	597	45	69	33	17	225	20	158	2729
PEAK HR FACTOR :		0.939			0.951			0.595			0.916		0.977

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_008 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Nogales St			Nogales St			La Puente Rd			La Puente Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	0	0	1	0	0.5	0.5	1	
10:00 AM	4	143	48	47	176		9	1	7	87	0	27	549
10:15 AM	1	163	55	42	200		6	4	5	77	0	31	584
10:30 AM	3	153	48	51	162		5	1	6	102	1	29	561
10:45 AM	0	157	50	43	177		6	4	6	79	0	30	552
11:00 AM	0	165	62	37	160		6	3	8	76	0	39	556
11:15 AM	0	167	42	39	165		10	1	12	81	0	42	559
11:30 AM	1	147	39	48	151		6	4	11	88	0	41	536
11:45 AM	0	167	67	43	202		3	3	11	75	0	28	599
12:00 PM	1	181	63	56	207		6	4	6	115	0	36	675
12:15 PM	2	188	61	40	171		7	4	7	82	0	39	601
12:30 PM	4	196	66	47	175		10	3	13	98	0	43	655
12:45 PM	1	195	56	48	214		3	3	8	95	0	40	663
1:00 PM	1	171	61	52	172		7	1	10	88	0	46	609
1:15 PM	0	210	65	40	176		5	8	12	92	0	40	648
1:30 PM	3	200	63	46	164		6	3	15	80	0	45	625
1:45 PM	1	205	87	33	167		6	5	26	96	0	51	677

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	22	2808	933	712	2839	0	101	52	163	1411	1	607	9649
APPROACH %'s :	0.58%	74.62%	24.79%	20.05%	79.95%	0.00%	31.96%	16.46%	51.58%	69.89%	0.05%	30.06%	

PEAK HR START TIME :	1200 PM												TOTAL
PEAK HR VOL :	8	760	246	191	767	0	26	14	34	390	0	158	2594
PEAK HR FACTOR :		0.953			0.911			0.712			0.907		0.961

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_009 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:	Nogales St			Nogales St			Valley Blvd Loop			Valley Blvd Loop			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	0	1	0	1.5	0.5	1	
7:00 AM	1	100	14	15	198	30	6	3	6	26	0	24	423
7:15 AM	8	129	31	31	229	23	13	1	2	35	0	46	548
7:30 AM	8	180	35	16	281	42	21	3	5	40	1	100	732
7:45 AM	8	146	31	31	298	58	20	6	8	58	0	77	741
8:00 AM	7	177	38	16	293	31	4	7	10	47	0	26	656
8:15 AM	9	131	42	25	260	25	3	2	9	35	0	19	560
8:30 AM	6	125	43	24	241	25	9	0	11	41	1	20	546
8:45 AM	4	120	36	20	263	23	9	0	12	31	1	18	537

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	51	1108	270	178	2063	257	85	22	63	313	3	330	4743
APPROACH %'s :	3.57%	77.54%	18.89%	7.13%	82.59%	10.29%	50.00%	12.94%	37.06%	48.45%	0.46%	51.08%	

PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	32	634	146	88	1132	156	48	18	32	180	1	222	2689
PEAK HR FACTOR :		0.910			0.889			0.721			0.715		0.907

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_009 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Nogales St			Nogales St			Valley Blvd Loop			Valley Blvd Loop			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	0	1	0	1.5	0.5	1	
4:00 PM	5	257	48	14	134	12	8	2	4	29	0	36	549
4:15 PM	4	261	41	23	169	8	10	1	2	23	0	27	569
4:30 PM	4	288	39	14	155	10	9	1	3	25	0	42	590
4:45 PM	8	277	46	24	135	6	7	0	3	48	1	41	596
5:00 PM	8	294	67	16	154	11	5	0	5	32	1	55	648
5:15 PM	3	279	47	16	165	9	9	1	2	30	0	57	618
5:30 PM	4	339	60	16	146	11	10	3	0	31	1	52	673
5:45 PM	1	313	48	26	157	12	6	0	6	28	0	47	644

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	37	2308	396	149	1215	79	64	8	25	246	3	357	4887
APPROACH %'s :	1.35%	84.20%	14.45%	10.33%	84.20%	5.47%	65.98%	8.25%	25.77%	40.59%	0.50%	58.91%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	16	1225	222	74	622	43	30	4	13	121	2	211	2583
PEAK HR FACTOR :		0.908			0.947			0.904			0.949		0.960

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_009 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Nogales St			Nogales St			Valley Blvd Loop			Valley Blvd Loop			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	0	1	0	1.5	0.5	1	
10:00 AM	11	199	58	20	238	22	14	2	9	20	0	50	643
10:15 AM	7	235	25	19	252	37	16	2	6	30	1	35	665
10:30 AM	9	192	31	8	238	16	13	0	12	32	2	43	596
10:45 AM	9	214	27	23	265	23	11	5	5	26	2	21	631
11:00 AM	8	227	33	14	226	10	8	1	11	30	0	57	625
11:15 AM	7	220	36	16	250	15	8	2	3	23	0	33	613
11:30 AM	4	183	35	15	250	10	11	1	7	38	1	29	584
11:45 AM	9	217	26	20	246	18	9	1	3	37	0	39	625
12:00 PM	3	252	18	17	309	14	9	0	9	26	0	38	695
12:15 PM	7	262	40	25	237	10	6	1	3	57	0	40	688
12:30 PM	6	255	31	16	282	25	7	1	2	43	0	44	712
12:45 PM	6	235	33	28	266	19	7	0	6	28	2	38	668
1:00 PM	7	255	29	12	255	19	9	1	7	33	1	39	667
1:15 PM	2	240	39	21	245	10	9	0	9	34	0	30	639
1:30 PM	3	227	23	14	239	22	8	2	3	31	0	52	624
1:45 PM	9	289	35	16	241	15	7	2	6	24	2	48	694

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	107	3702	519	284	4039	285	152	21	101	512	11	636	10369
APPROACH %'s :	2.47%	85.54%	11.99%	6.16%	87.65%	6.18%	55.47%	7.66%	36.86%	44.18%	0.95%	54.87%	

PEAK HR START TIME :	1200 PM												TOTAL
PEAK HR VOL :	22	1004	122	86	1094	68	29	2	20	154	2	160	2763
PEAK HR FACTOR :		0.929			0.918			0.708			0.814		0.970

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_010 | **Day:** TUESDAY

City: City of Industry | **Date:** 4/16/2013

AM

NS/EW Streets:	Valley Blvd Loop			Valley Blvd Loop			Valley Blvd			Valley Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	2	0	1	2	3	0	0	2	1	
7:00 AM				13		21	13	53			246	36	382
7:15 AM				29		35	33	102			263	49	511
7:30 AM				19		38	67	150			221	73	568
7:45 AM				30		39	53	143			262	84	611
8:00 AM				23		39	28	117			250	45	502
8:15 AM				26		40	8	89			251	46	460
8:30 AM				27		40	12	89			210	48	426
8:45 AM				29		24	17	118			237	34	459

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	196	0	276	231	861	0	0	1940	415	3919
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	41.53%	0.00%	58.47%	21.15%	78.85%	0.00%	0.00%	82.38%	17.62%	

PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	0	0	0	101	0	151	181	512	0	0	996	251	2192
PEAK HR FACTOR :		0.000			0.913			0.798			0.901		0.897

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_010 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Valley Blvd Loop			Valley Blvd Loop			Valley Blvd			Valley Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	2	0	1	2	3	0	0	2	1	
4:00 PM				42		21	25	225			134	39	486
4:15 PM				47		18	20	224			120	30	459
4:30 PM				40		15	19	249			153	47	523
4:45 PM				44		25	32	241			140	62	544
5:00 PM				55		27	16	258			179	70	605
5:15 PM				48		18	29	269			165	57	586
5:30 PM				57		23	31	277			149	53	590
5:45 PM				51		22	26	268			150	48	565

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	384	0	169	198	2011	0	0	1190	406	4358
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	69.44%	0.00%	30.56%	8.96%	91.04%	0.00%	0.00%	74.56%	25.44%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	0	0	211	0	90	102	1072	0	0	643	228	2346
PEAK HR FACTOR :		0.000			0.918			0.953			0.874		0.969

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_010 | **Day:** SATURDAY

City: City of Industry | **Date:** 4/13/2013

NOON

NS/EW Streets:	Valley Blvd Loop			Valley Blvd Loop			Valley Blvd			Valley Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	2	0	1	2	3	0	0	2	1	
10:00 AM				33		37	18	90			138	61	377
10:15 AM				22		17	23	87			113	37	299
10:30 AM				19		22	21	92			111	54	319
10:45 AM				26		20	10	77			98	37	268
11:00 AM				25		20	25	104			109	56	339
11:15 AM				39		17	16	72			102	31	277
11:30 AM				24		21	16	108			98	47	314
11:45 AM				27		17	23	99			101	35	302
12:00 PM				23		20	19	110			125	47	344
12:15 PM				33		28	27	99			113	51	351
12:30 PM				32		19	23	115			121	50	360
12:45 PM				40		20	25	105			106	40	336
1:00 PM				29		16	19	102			120	52	338
1:15 PM				34		18	16	97			110	46	321
1:30 PM				26		20	35	85			129	45	340
1:45 PM				24		20	22	85			105	52	308

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	0	0	456	0	332	338	1527	0	0	1799	741	5193
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	57.87%	0.00%	42.13%	18.12%	81.88%	0.00%	0.00%	70.83%	29.17%	

PEAK HR START TIME :	1200 PM												TOTAL
PEAK HR VOL :	0	0	0	128	0	87	94	429	0	0	465	188	1391
PEAK HR FACTOR :		0.000			0.881			0.947			0.949		0.966

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_011 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:	Nogales St			Nogales St			San Jose Ave			San Jose Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	0	2	0	0	2	0	
7:00 AM	31	140	16	8	206	6	2	10	2	5	7	1	434
7:15 AM	14	205	17	6	228	19	3	6	7	4	20	2	531
7:30 AM	25	240	13	11	270	16	2	6	15	9	27	3	637
7:45 AM	54	244	27	11	336	22	2	11	23	7	27	1	765
8:00 AM	52	248	26	14	322	19	1	12	18	12	32	13	769
8:15 AM	62	262	29	23	243	29	4	19	16	8	44	12	751
8:30 AM	58	229	18	21	252	25	2	16	13	9	45	7	695
8:45 AM	51	217	26	6	257	25	5	11	12	7	23	10	650

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	347	1785	172	100	2114	161	21	91	106	61	225	49	5232
APPROACH %'s :	15.06%	77.47%	7.47%	4.21%	89.01%	6.78%	9.63%	41.74%	48.62%	18.21%	67.16%	14.63%	

PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	226	983	100	69	1153	95	9	58	70	36	148	33	2980
PEAK HR FACTOR :		0.927			0.892			0.878			0.848		0.969

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_011 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Nogales St			Nogales St			San Jose Ave			San Jose Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	0	2	0	0	2	0	
4:00 PM	10	300	18	6	184	3	14	46	30	18	15	17	661
4:15 PM	12	264	13	13	214	3	9	36	26	10	8	22	630
4:30 PM	15	273	15	10	193	3	21	34	46	13	14	15	652
4:45 PM	12	282	10	9	207	9	11	28	37	26	11	36	678
5:00 PM	17	295	8	11	228	8	31	66	61	31	25	22	803
5:15 PM	16	313	18	13	225	18	20	65	41	25	22	10	786
5:30 PM	15	314	16	11	221	12	39	81	71	18	28	19	845
5:45 PM	12	286	15	13	217	10	32	97	60	14	12	11	779

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	109	2327	113	86	1689	66	177	453	372	155	135	152	5834
APPROACH %'s :	4.28%	91.29%	4.43%	4.67%	91.74%	3.59%	17.66%	45.21%	37.13%	35.07%	30.54%	34.39%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	60	1208	57	48	891	48	122	309	233	88	87	62	3213
PEAK HR FACTOR :		0.955			0.964			0.869			0.760		0.951

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_011 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Nogales St			Nogales St			San Jose Ave			San Jose Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	0	2	0	0	2	0	
10:00 AM	16	262	33	7	250	6	6	13	12	21	11	6	643
10:15 AM	16	241	55	7	289	7	6	9	10	23	8	9	680
10:30 AM	18	214	36	3	238	8	0	13	9	23	7	13	582
10:45 AM	13	227	36	13	306	9	3	11	14	35	13	11	691
11:00 AM	8	238	37	11	250	6	7	11	7	27	12	11	625
11:15 AM	18	237	23	9	275	9	2	10	6	29	12	16	646
11:30 AM	12	208	40	9	269	6	4	12	3	33	17	7	620
11:45 AM	18	239	27	13	266	9	4	8	5	37	10	11	647
12:00 PM	15	241	42	6	304	9	4	18	11	24	5	8	687
12:15 PM	20	291	40	10	274	18	3	6	7	38	20	15	742
12:30 PM	26	250	41	9	287	8	5	11	11	45	24	33	750
12:45 PM	16	245	37	13	285	18	4	7	4	40	12	8	689
1:00 PM	22	278	24	16	245	7	4	14	8	37	12	9	676
1:15 PM	19	257	19	11	273	8	10	9	7	29	10	12	664
1:30 PM	15	238	28	8	248	16	3	9	7	37	9	19	637
1:45 PM	11	302	40	9	272	17	4	11	9	39	11	18	743
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	263	3968	558	154	4331	161	69	172	130	517	193	206	10722
APPROACH %'s :	5.49%	82.86%	11.65%	3.31%	93.22%	3.47%	18.60%	46.36%	35.04%	56.44%	21.07%	22.49%	
PEAK HR START TIME :	1200 PM												TOTAL
PEAK HR VOL :	77	1027	160	38	1150	53	16	42	33	147	61	64	2868
PEAK HR FACTOR :		0.900			0.973			0.689			0.667		0.956

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_012 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:	Nogales St			Nogales St			Railroad St			Railroad St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	1	1	0	0	0	0	
7:00 AM	22	190			209	4	0		1				426
7:15 AM	23	234			235	5	1		4				502
7:30 AM	21	276			292	4	1		4				598
7:45 AM	34	326			356	10	2		7				735
8:00 AM	52	328			349	5	1		9				744
8:15 AM	58	351			257	10	0		2				678
8:30 AM	69	306			268	9	0		3				655
8:45 AM	41	291			270	8	1		6				617

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	320	2302	0	0	2236	55	6	0	36	0	0	0	4955
APPROACH %'s :	12.20%	87.80%	0.00%	0.00%	97.60%	2.40%	14.29%	0.00%	85.71%	#DIV/0!	#DIV/0!	#DIV/0!	

PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	213	1311	0	0	1230	34	3	0	21	0	0	0	2812
PEAK HR FACTOR :		0.932			0.863			0.600			0.000		0.945

CONTROL : 1-Way Stop (EB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_012 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Nogales St			Nogales St			Railroad St			Railroad St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	1	1	0	0	0	0	
4:00 PM	9	327			233	2	2		12				585
4:15 PM	7	288			248	3	2		11				559
4:30 PM	9	303			250	3	1		29				595
4:45 PM	3	301			269	2	3		15				593
5:00 PM	10	319			316	7	1		40				693
5:15 PM	2	339			287	6	9		20				663
5:30 PM	3	342			306	8	5		41				705
5:45 PM	6	300			296	2	10		16				630

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	49	2519	0	0	2205	33	33	0	184	0	0	0	5023
APPROACH %'s :	1.91%	98.09%	0.00%	0.00%	98.53%	1.47%	15.21%	0.00%	84.79%	#DIV/0!	#DIV/0!	#DIV/0!	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	21	1300	0	0	1205	23	25	0	117	0	0	0	2691
PEAK HR FACTOR :		0.957			0.950			0.772			0.000		0.954

CONTROL : 1-Way Stop (EB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_012 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Nogales St			Nogales St			Railroad St			Railroad St			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	1	1	0	0	0	0	
10:00 AM	37	301			285	7	1		14				645
10:15 AM	18	303			314	4	1		7				647
10:30 AM	15	253			269	9	2		5				553
10:45 AM	21	275			344	3	0		7				650
11:00 AM	18	271			279	2	1		6				577
11:15 AM	27	258			305	7	4		6				607
11:30 AM	11	258			298	10	1		9				587
11:45 AM	20	283			306	11	1		11				632
12:00 PM	15	288			339	7	0		8				657
12:15 PM	12	345			307	8	0		7				679
12:30 PM	19	320			354	8	0		13				714
12:45 PM	18	295			334	4	1		9				661
1:00 PM	12	321			302	8	1		3				647
1:15 PM	9	276			296	12	0		5				598
1:30 PM	7	295			287	10	0		10				609
1:45 PM	15	342			306	11	2		7				683

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	274	4684	0	0	4925	121	15	0	127	0	0	0	10146
APPROACH %'s :	5.53%	94.47%	0.00%	0.00%	97.60%	2.40%	10.56%	0.00%	89.44%	#DIV/0!	#DIV/0!	#DIV/0!	

PEAK HR START TIME :	1200 PM												TOTAL
PEAK HR VOL :	64	1248	0	0	1334	27	1	0	37	0	0	0	2711
PEAK HR FACTOR :		0.919			0.940			0.731			0.000		0.949

CONTROL : 1-Way Stop (EB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_013 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:	Nogales St			Nogales St			East Gale Ave/East Walnut Dr North			East Gale Ave/East Walnut Dr North			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	1	1	0	1	1	0	
7:00 AM	24	197	10	15	198	9	4	8	3	10	25	12	515
7:15 AM	26	230	15	15	206	18	7	13	4	19	28	20	601
7:30 AM	42	268	33	20	238	19	9	11	11	17	46	20	734
7:45 AM	70	305	53	73	262	35	11	21	8	27	51	45	961
8:00 AM	73	319	40	56	259	35	16	17	12	31	58	45	961
8:15 AM	71	372	30	28	191	38	8	16	19	24	57	29	883
8:30 AM	77	334	45	26	201	38	14	19	16	22	62	27	881
8:45 AM	64	291	48	27	183	45	17	22	21	21	74	24	837

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	447	2316	274	260	1738	237	86	127	94	171	401	222	6373
APPROACH %'s :	14.72%	76.26%	9.02%	11.63%	77.76%	10.60%	28.01%	41.37%	30.62%	21.54%	50.50%	27.96%	

PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	291	1330	168	183	913	146	49	73	55	104	228	146	3686
PEAK HR FACTOR :		0.946			0.839			0.903			0.892		0.959

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_013 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Nogales St			Nogales St			East Gale Ave/East Walnut Dr North			East Gale Ave/East Walnut Dr North			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	1	1	0	1	1	0	
4:00 PM	66	239	22	26	198	18	69	67	89	33	44	28	899
4:15 PM	65	219	20	27	195	40	51	67	79	25	35	24	847
4:30 PM	59	237	17	24	240	17	54	78	90	42	46	24	928
4:45 PM	58	233	21	29	199	43	44	74	94	23	48	27	893
5:00 PM	57	247	19	42	265	27	55	89	101	63	58	27	1050
5:15 PM	50	263	20	28	252	21	59	69	69	53	46	19	949
5:30 PM	62	252	18	21	289	20	65	93	118	52	65	28	1083
5:45 PM	48	229	13	29	282	29	60	90	78	59	67	17	1001

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	465	1919	150	226	1920	215	457	627	718	350	409	194	7650
APPROACH %'s :	18.35%	75.73%	5.92%	9.57%	81.32%	9.11%	25.36%	34.79%	39.84%	36.73%	42.92%	20.36%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	217	991	70	120	1088	97	239	341	366	227	236	91	4083
PEAK HR FACTOR :		0.959			0.960			0.857			0.936		0.943

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_013 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Nogales St			Nogales St			East Gale Ave/East Walnut Dr North			East Gale Ave/East Walnut Dr North			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	0	1	1	0	1	1	0	
10:00 AM	71	283	51	29	193	44	31	27	45	32	77	21	904
10:15 AM	62	262	39	18	214	47	29	27	57	31	75	14	875
10:30 AM	80	213	17	20	203	53	26	30	76	32	60	26	836
10:45 AM	58	239	30	25	215	44	34	37	75	33	65	20	875
11:00 AM	67	221	23	25	234	37	37	29	78	27	73	27	878
11:15 AM	60	234	19	24	214	53	35	41	75	44	88	22	909
11:30 AM	71	213	23	19	230	49	34	31	102	36	84	20	912
11:45 AM	60	229	18	28	235	43	42	48	94	43	78	29	947
12:00 PM	67	238	21	21	241	43	40	41	101	44	81	22	960
12:15 PM	68	275	22	16	254	43	60	48	102	37	83	28	1036
12:30 PM	69	273	28	26	247	59	52	49	93	45	77	13	1031
12:45 PM	57	246	25	33	226	60	41	57	83	32	71	27	958
1:00 PM	84	261	24	25	222	53	49	62	103	35	90	21	1029
1:15 PM	64	220	20	23	255	37	56	55	120	36	68	18	972
1:30 PM	67	237	19	19	235	32	62	64	107	41	61	9	953
1:45 PM	67	249	32	28	251	24	71	48	104	39	70	27	1010

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	1072	3893	411	379	3669	721	699	694	1415	587	1201	344	15085
APPROACH %'s :	19.94%	72.41%	7.65%	7.95%	76.93%	15.12%	24.89%	24.72%	50.39%	27.53%	56.33%	16.14%	

PEAK HR START TIME :	1215 PM												TOTAL
PEAK HR VOL :	278	1055	99	100	949	215	202	216	381	149	321	89	4054
PEAK HR FACTOR :		0.968			0.952			0.933			0.944		0.978

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_014 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:	Nogales St			Nogales St			SR-60 Freeway WB Ramps			SR-60 Freeway WB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	3	1	2.5	0.5	0	0	0	0	0.5	0	1.5	
7:00 AM		143	55		150	63				56		89	556
7:15 AM		176	59		178	51				61		95	620
7:30 AM		214	54		218	48				67		129	730
7:45 AM		299	69		242	53				84		128	875
8:00 AM		288	82		238	64				70		147	889
8:15 AM		289	80		188	47				83		185	872
8:30 AM		293	50		180	59				53		161	796
8:45 AM		239	66		159	66				81		166	777

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	1941	515	0	1553	451	0	0	0	555	0	1100	6115
APPROACH %'s :	0.00%	79.03%	20.97%	0.00%	77.50%	22.50%	#DIV/0!	#DIV/0!	#DIV/0!	33.53%	0.00%	66.47%	

PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	0	1169	281	0	848	223	0	0	0	290	0	621	3432
PEAK HR FACTOR :		0.980			0.887			0.000			0.850		0.965

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_014 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Nogales St			Nogales St			SR-60 Freeway WB Ramps			SR-60 Freeway WB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	3	1	2.5	0.5	0	0	0	0	0.5	0	1.5	
4:00 PM		257	48		227	93				57		70	752
4:15 PM		220	44		229	70				59		83	705
4:30 PM		247	56		277	94				63		65	802
4:45 PM		238	56		244	72				93		76	779
5:00 PM		263	43		301	128				100		62	897
5:15 PM		265	45		262	112				94		67	845
5:30 PM		268	61		351	107				102		65	954
5:45 PM		223	67		312	107				87		68	864

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	1981	420	0	2203	783	0	0	0	655	0	556	6598
APPROACH %'s :	0.00%	82.51%	17.49%	0.00%	73.78%	26.22%	#DIV/0!	#DIV/0!	#DIV/0!	54.09%	0.00%	45.91%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	1019	216	0	1226	454	0	0	0	383	0	262	3560
PEAK HR FACTOR :		0.938			0.917			0.000			0.966		0.933

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_014 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Nogales St			Nogales St			SR-60 Freeway WB Ramps			SR-60 Freeway WB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	3	1	2.5	0.5	0	0	0	0	0.5	0	1.5	
10:00 AM		225	3		205	74				129		177	813
10:15 AM		242	94		221	87				89		106	839
10:30 AM		209	79		236	70				100		99	793
10:45 AM		231	79		232	94				99		107	842
11:00 AM		218	72		237	112				98		94	831
11:15 AM		222	80		225	112				113		103	855
11:30 AM		229	67		282	94				98		102	872
11:45 AM		226	72		280	99				106		94	877
12:00 PM		237	95		288	101				111		115	947
12:15 PM		276	106		290	95				107		104	978
12:30 PM		252	91		267	106				111		105	932
12:45 PM		231	78		238	106				98		111	862
1:00 PM		262	94		254	110				86		95	901
1:15 PM		211	98		285	115				104		96	909
1:30 PM		240	88		276	110				107		108	929
1:45 PM		227	72		275	114				103		111	902

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	3738	1268	0	4091	1599	0	0	0	1659	0	1727	14082
APPROACH %'s :	0.00%	74.67%	25.33%	0.00%	71.90%	28.10%	#DIV/0!	#DIV/0!	#DIV/0!	49.00%	0.00%	51.00%	

PEAK HR START TIME :	1145 AM												TOTAL
PEAK HR VOL :	0	991	364	0	1125	401	0	0	0	435	0	418	3734
PEAK HR FACTOR :		0.887			0.981			0.000			0.944		0.954

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_015 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:		Nogales St			Nogales St			SR-60 Freeway EB Ramps			SR-60 Freeway EB Ramps		
		NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	3	1	0	3	1	1.5	0	0.5	0	0	0	
7:00 AM		156	56		156	50	42		34				494
7:15 AM		173	65		176	63	62		36				575
7:30 AM		194	107		229	55	72		59				716
7:45 AM		257	96		281	45	110		71				860
8:00 AM		280	91		242	66	90		73				842
8:15 AM		263	107		215	56	107		51				799
8:30 AM		249	93		188	45	94		48				717
8:45 AM		206	82		184	56	99		58				685

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	1778	697	0	1671	436	676	0	430	0	0	0	5688
APPROACH %'s :	0.00%	71.84%	28.16%	0.00%	79.31%	20.69%	61.12%	0.00%	38.88%	#DIV/0!	#DIV/0!	#DIV/0!	

PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	0	1049	387	0	926	212	401	0	243	0	0	0	3218
PEAK HR FACTOR :		0.968			0.873			0.890			0.000		0.935

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_015 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Nogales St			Nogales St			SR-60 Freeway EB Ramps			SR-60 Freeway EB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	3	1	0	3	1	1.5	0	0.5	0	0	0	
4:00 PM	2	213	55		211	72	92		76				721
4:15 PM	0	188	57		241	47	75		69				677
4:30 PM	1	207	65		278	62	96		78				787
4:45 PM	0	212	51		280	57	82		98				780
5:00 PM	0	205	82		323	79	102		99				890
5:15 PM	0	214	70		300	56	96		89				825
5:30 PM	0	228	71		371	81	101		112				964
5:45 PM	0	193	65		328	71	96		120				873

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	3	1660	516	0	2332	525	740	0	741	0	0	0	6517
APPROACH %'s :	0.14%	76.18%	23.68%	0.00%	81.62%	18.38%	49.97%	0.00%	50.03%	#DIV/0!	#DIV/0!	#DIV/0!	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	840	288	0	1322	287	395	0	420	0	0	0	3552
PEAK HR FACTOR :		0.943			0.890			0.943			0.000		0.921

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_015 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Nogales St			Nogales St			SR-60 Freeway EB Ramps			SR-60 Freeway EB Ramps			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	3	1	0	3	1	1.5	0	0.5	0	0	0	
10:00 AM		145	96		261	64	88		68				722
10:15 AM		239	104		237	63	94		68				805
10:30 AM		228	98		243	85	61		58				773
10:45 AM		221	92		247	85	93		89				827
11:00 AM		208	82		243	88	72		64				757
11:15 AM		220	100		263	69	86		74				812
11:30 AM		215	85		286	85	84		92				847
11:45 AM		207	99		286	100	97		86				875
12:00 PM		226	129		284	106	108		92				945
12:15 PM		264	91		298	85	119		79				936
12:30 PM		250	104		292	79	91		95				911
12:45 PM		217	103		249	88	99		94				850
1:00 PM		261	97		252	92	90		94				886
1:15 PM		238	116		288	105	69		99				915
1:30 PM		255	123		261	117	74		85				915
1:45 PM		203	99		269	112	103		97				883

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	3597	1618	0	4259	1423	1428	0	1334	0	0	0	13659
APPROACH %'s :	0.00%	68.97%	31.03%	0.00%	74.96%	25.04%	51.70%	0.00%	48.30%	#DIV/0!	#DIV/0!	#DIV/0!	

PEAK HR START TIME :	1145 AM												TOTAL
PEAK HR VOL :	0	947	423	0	1160	370	415	0	352	0	0	0	3667
PEAK HR FACTOR :		0.965			0.981			0.959			0.000		0.970

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_016 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

AM

NS/EW Streets:	Nogales St			Nogales St			Colima Rd			Colima Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	1	2	2	1	2	3	0	2	3	0	
7:00 AM	23	97	17	22	83	39	35	48	24	22	99	59	568
7:15 AM	43	113	18	34	133	43	59	89	31	31	83	58	735
7:30 AM	47	151	24	55	184	45	77	154	54	30	125	60	1006
7:45 AM	88	196	42	73	170	71	94	153	60	60	175	82	1264
8:00 AM	105	171	43	68	142	73	86	153	43	44	195	116	1239
8:15 AM	73	223	28	52	130	55	99	116	45	46	173	75	1115
8:30 AM	49	146	28	45	111	56	76	98	21	29	172	73	904
8:45 AM	52	132	16	56	86	70	99	111	21	17	128	60	848

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	480	1229	216	405	1039	452	625	922	299	279	1150	583	7679
APPROACH %'s :	24.94%	63.84%	11.22%	21.36%	54.80%	23.84%	33.86%	49.95%	16.20%	13.87%	57.16%	28.98%	

PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	313	741	137	248	626	244	356	576	202	180	668	333	4624
PEAK HR FACTOR :		0.913			0.890			0.923			0.832		0.915

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_016 **Day:** TUESDAY

City: City of Industry **Date:** 4/16/2013

PM

NS/EW Streets:	Nogales St			Nogales St			Colima Rd			Colima Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	1	2	2	1	2	3	0	2	3	0	
4:00 PM	58	119	40	85	128	66	84	214	30	34	154	53	1065
4:15 PM	49	108	28	109	126	66	76	198	38	26	145	43	1012
4:30 PM	62	120	30	106	171	70	75	199	51	29	137	54	1104
4:45 PM	53	111	39	112	155	66	100	232	51	36	116	52	1123
5:00 PM	56	143	39	109	175	97	80	242	38	53	157	54	1243
5:15 PM	53	133	46	110	167	89	96	221	54	41	139	53	1202
5:30 PM	64	138	26	101	210	106	72	217	49	47	161	62	1253
5:45 PM	58	117	52	120	217	94	87	209	56	45	152	55	1262
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	453	989	300	852	1349	654	670	1732	367	311	1161	426	9264
APPROACH %'s :	26.00%	56.77%	17.22%	29.84%	47.25%	22.91%	24.20%	62.55%	13.25%	16.39%	61.17%	22.44%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	231	531	163	440	769	386	335	889	197	186	609	224	4960
PEAK HR FACTOR :		0.972			0.925			0.958			0.944		0.983

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA13_5200_016 **Day:** SATURDAY

City: City of Industry **Date:** 4/13/2013

NOON

NS/EW Streets:	Nogales St			Nogales St			Colima Rd			Colima Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	1	2	2	1	2	3	0	2	3	0	
10:00 AM	58	97	23	59	98	132	88	142	17	25	174	72	985
10:15 AM	48	119	24	88	98	112	95	117	34	23	135	68	961
10:30 AM	49	113	26	71	83	86	97	137	37	28	195	89	1011
10:45 AM	54	113	24	98	74	118	114	155	33	30	134	67	1014
11:00 AM	56	117	23	67	100	103	96	144	26	35	182	76	1025
11:15 AM	53	117	24	81	99	109	103	139	37	26	177	67	1032
11:30 AM	55	113	32	87	130	96	104	169	50	42	192	64	1134
11:45 AM	66	108	27	99	123	123	119	176	51	39	196	62	1189
12:00 PM	83	168	24	79	156	127	105	211	37	34	219	74	1317
12:15 PM	66	132	34	94	115	146	121	158	38	36	186	76	1202
12:30 PM	54	125	33	104	133	116	116	188	57	41	168	71	1206
12:45 PM	60	109	34	103	101	114	122	163	37	33	181	81	1138
1:00 PM	42	115	28	91	132	111	96	180	34	29	208	94	1160
1:15 PM	56	109	25	107	124	132	120	207	35	28	181	85	1209
1:30 PM	56	115	23	81	115	121	103	181	35	40	184	84	1138
1:45 PM	56	105	27	109	121	123	111	143	31	40	170	69	1105

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	912	1875	431	1418	1802	1869	1710	2610	589	529	2882	1199	17826
APPROACH %'s :	28.34%	58.27%	13.39%	27.86%	35.41%	36.73%	34.83%	53.17%	12.00%	11.48%	62.52%	26.01%	

PEAK HR START TIME :	1145 AM												TOTAL
PEAK HR VOL :	269	533	118	376	527	512	461	733	183	150	769	283	4914
PEAK HR FACTOR :		0.836			0.977			0.954			0.919		0.933

CONTROL : Signalized

APPENDIX D

Explanation and Calculation of
Intersection Capacity Utilization/Delay

EXPLANATION AND CALCULATION OF
INTERSECTION CAPACITY UTILIZATION

Overview

The ability of a roadway to carry traffic is referred to as capacity. The capacity is usually greater between intersections and less at intersections because traffic flows continuously between them and only during the green phase at them. Capacity at intersections is best defined in terms of vehicles per lane per hour of green. If capacity is 1,600 vehicles per lane per hour of green, and if the green phase is 50 percent of the cycle and there are three lanes, then the capacity is 1,600 times 50 percent times 3 lanes, or 2,400 vehicles per hour for that approach.

The technique used to compare the volume and capacity at a signalized intersection is known as Intersection Capacity Utilization. Intersection Capacity Utilization, usually expressed as a percent, is the proportion of an hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. If an intersection is operating at 80 percent of capacity (i.e., an Intersection Capacity Utilization of 80 percent), then 20 percent of the signal cycle is not used. The signal could show red on all indications 20 percent of the time and the signal would just accommodate approaching traffic.

Intersection Capacity Utilization analysis consists of (a) determining the proportion of signal time needed to serve each conflicting movement of traffic, (b) summing the times for the movements, and (c) comparing the total time required to the total time available. For example, if for north-south traffic the northbound traffic is 1,600 vehicles per hour, the southbound traffic is 1,200 vehicles per hour, and the capacity of either direction is 3,200 vehicles per hour, then the northbound traffic is critical and requires 1,600/3,200 or 50 percent of the signal time. If for east-west traffic, 30 percent of the signal time is required, then it can be seen that the Intersection Capacity Utilization is 50 plus 30, or 80 percent. When left turn arrows (left turn phasing) exist, they are incorporated into the analysis. The critical movements are usually the heavy left turn movements and the opposing through movements.

The Intersection Capacity Utilization technique is an ideal tool to quantify existing as well as future intersection operation. The impact of adding a lane can be quickly determined by examining the effect the lane has on the Intersection Capacity Utilization.

Intersection Capacity Utilization Worksheets That Follow This Discussion

The Intersection Capacity Utilization worksheet table contains the following information:

1. Peak hour turning movement volumes.

2. Number of lanes that serve each movement.

3. For right turn lanes, whether the lane is a free right turn lane, whether it has a right turn arrow, and the percent of right turns on red that are assumed.

4. Capacity assumed per lane.

5. Capacity available to serve each movement (number of lanes times capacity per lane).

6. Volume to capacity ratio for each movement.

7. Whether the movement's volume to capacity ratio is critical and adds to the Intersection Capacity Utilization value.

8. The yellow time or clearance interval assumed.

9. Adjustments for right turn movements.

10. The Intersection Capacity Utilization and Level of Service.

The Intersection Capacity Utilization Worksheet also has two graphics on the same page. These two graphics show the following:

1. Peak hour turning movement volumes.

2. Number of lanes that serve each movement.

3. The approach and exit leg volumes.

4. The two-way leg volumes.

5. An estimate of daily traffic volumes that is fairly close to actual counts and is based strictly on the peak hour leg volumes multiplied by a factor.

6. Percent of daily traffic in peak hours.

7. Percent of peak hour leg volume that is inbound versus outbound.

A more detailed discussion of Intersection Capacity Utilization and Level of Service follows.

Level of Service

Level of Service is used to describe the quality of traffic flow. Levels of Service A to C operate quite well. Level of Service C is typically the standard to which rural roadways are designed.

Level of Service D is characterized by fairly restricted traffic flow. Level of Service D is the standard to which urban roadways are typically designed. Level of Service E is the maximum volume a facility can accommodate and will result in possible stoppages of momentary duration. Level of Service F occurs when a facility is overloaded and is characterized by stop-and-go traffic with stoppages of long duration.

A description of the various Levels of Service appears at the end of the Intersection Capacity Utilization description, along with the relationship between Intersection Capacity Utilization and Level of Service.

Signalized Intersections

Although calculating an Intersection Capacity Utilization value for an unsignalized intersection is invalid, the presumption is that a signal can be installed and the calculation shows whether the geometrics are capable of accommodating the expected volumes with a signal. A traffic signal becomes warranted before Level of Service D is reached for a signalized intersection.

Signal Timing

The Intersection Capacity Utilization calculation assumes that a signal is properly timed. It is possible to have an Intersection Capacity Utilization well below 100 percent, yet have severe traffic congestion. This would occur if one or more movements is not getting sufficient green time to satisfy its demand, and excess green time exists on other movements. This is an operational problem that should be remedied.

Lane Capacity

Capacity is often defined in terms of roadway width; however, standard lanes have approximately the same capacity whether they are 11 or 14 feet wide. Our data indicates a typical lane, whether a through lane or a left turn lane, has a capacity of approximately 1,750 vehicles per hour of green time, with nearly all locations showing a capacity greater than 1,600 vehicles per hour of green per lane. Right turn lanes have a slightly lower capacity; however 1,600 vehicles per hour is a valid capacity assumption for right turn lanes.

This finding is published in the August 1978 issue of Institute of Transportation Engineers Journal in the article entitled, "Another Look at Signalized Intersection Capacity" by William Kunzman. A capacity of 1,600 vehicles per hour per lane with no yellow time penalty, or 1,700 vehicles per hour with a 3 or 5 percent yellow time penalty is reasonable.

Yellow Time

The yellow time can either be assumed to be completely used and no penalty applied, or it can be assumed to be only partially usable. Total yellow time accounts for approximately 10 percent of a signal cycle, and a penalty of 3 to 5 percent is reasonable.

During peak hour traffic operation the yellow times are nearly completely used. If there is no left turn phasing, the left turn vehicles completely use the yellow time. Even if there is left turn phasing, the through traffic continues to enter the intersection on the yellow until just a split second before the red.

Shared Lanes

Shared lanes occur in many locations. A shared lane is often found at the end of an off ramp where the ramp forms an intersection with the cross street. Often at a diamond interchange off ramp, there are three lanes. In the case of a diamond interchange, the middle lane is sometimes shared, and the driver can turn left, go through, or turn right from that lane.

If one assumes a three lane off ramp as described above, and if one assumes that each lane has 1,600 capacity, and if one assumes that there are 1,000 left turns per hour, 500 right turns per hour, and 100 through vehicles per hour, then how should one assume that the three lanes operate. There are three ways that it is done.

One way is to just assume that all 1,600 vehicles (1,000 plus 500 plus 100) are served simultaneously by three lanes. When this is done, the capacity is 3 times 1,600 or 4,800, and the amount of green time needed to serve the ramp is 1,600 vehicles divided by 4,800 capacity or 33.3 percent. This assumption effectively assumes perfect lane distribution between the three lanes that is not realistic. It also means a left turn can be made from the right lane.

Another way is to equally split the capacity of a shared lane and in this case to assume there are 1.33 left turn lanes, 1.33 right turn lanes, and 0.33 through lanes. With this assumption, the critical movement is the left turns and the 1,000 left turns are served by a capacity of 1.33 times 1,600, or 2,133. The volume to capacity ratio of the critical move is 1,000 divided by 2,133 or 46.9 percent.

The first method results in a critical move of 33.3 percent and the second method results in a critical move of 46.9 percent. Neither is very accurate, and the difference in the calculated Level of Service will be approximately 1.5 Levels of Service (one Level of Service is 10 percent).

The way Kunzman Associates does it is to assign fractional lanes in a reasonable way. In this example, it would be assumed that there is 1.1 right turn lanes, 0.2 through lanes, and 1.7 left turn lanes. The volume to capacity ratios for each movement would be 31.3 percent for the through traffic, 28.4 percent for the right turn movement, and 36.8 percent for the left turn movement. The critical movement would be the 36.8 percent for the left turns.

Right Turn on Red

Kunzman Associates' software treats right turn lanes in one of five different ways. Each right turn lane is classified into one of five cases. The five cases are (1) free right turn lane, (2) right turn lane with separate right turn arrow, (3) standard right turn lane with no right turns on red allowed, (4) standard right turn lane with a certain percentage of right turns on red allowed, and (5) separate right turn arrow and a certain percentage of right turns on red allowed.

Free Right Turn Lane

If it is a free right turn lane, then it is given a capacity of one full lane with continuous or 100 percent green time. A Free right turn lane occurs when there is a separate approach lane for right turning vehicles, there is a separate departure lane for the right turning vehicles after they turn and are exiting the intersection, and the through cross street traffic does not interfere with the vehicles after they turn right.

Separate Right Turn Arrow

If there is a separate right turn arrow, then it is assumed that vehicles are given a green indication and can proceed on what is known as the left turn overlap.

The left turn overlap for a northbound right turn is the westbound left turn. When the left turn overlap has a green indication, the right turn lane is also given a green arrow indication. Thus, if there is a northbound right turn arrow, then it can be turned green for the period of time that the westbound left turns are proceeding.

If there are more right turns than can be accommodated during the northbound through green and the time that the northbound right turn arrow is on, then an adjustment is made to the Intersection Capacity Utilization to account for the green time that needs to be added to the northbound through green to accommodate the northbound right turns.

Standard Right Turn Lane, No Right Turns on Red

A standard right turn lane, with no right turn on red assumed, proceeds only when there is a green indication displayed for the adjacent through movement. If additional green time is needed above that amount of time, then in the Intersection Capacity Utilization calculation a right turn adjustment green time is added above the green time that is needed to serve the adjacent through movement.

Standard Right Turn Lane, With Right Turns on Red

A standard right turn lane with say 20 percent of the right turns allowed to turn right on a red indication is calculated the same as the standard right turn case where there is no right turn on red allowed, except that the right turn adjustment is reduced to account for the 20 percent of the right turning vehicles that can logically turn right on a red light. The right turns on red are never allowed to exceed the time the overlap left turns take plus the unused part of the green cycle that the cross street traffic moving from left to right has.

As an example of how 20 percent of the cars are allowed to turn right on a red indication, assume that the northbound right turn volume needs 40 percent of the signal cycle to be satisfied. To allow 20 percent of the northbound right turns to turn right on red, then during 8 percent of the signal cycle (40 percent of signal cycle times 20 percent that can turn right on red) right turns on red will be allowed if it is feasible.

For this example, assume that 15 percent of the signal cycle is green for the northbound through traffic, and that means that 15 percent of the signal cycle is available to satisfy northbound right turns. After the northbound through traffic has received its green, 25 percent of the signal cycle is still needed to satisfy the northbound right turns (40 percent of the signal cycle minus the 15 percent of the signal cycle that the northbound through used).

Assume that the westbound left turns require a green time of 6 percent of the signal cycle. This 6 percent of the signal cycle is used by northbound right turns on red. After accounting for the northbound right turns that occur on the westbound overlap left turn, 19 percent of the signal cycle is still needed for the northbound right turns (25 percent of the cycle was needed after the northbound through green time was accounted for [see above paragraph], and 6 percent was served during the westbound left turn overlap). Also, at this point 6 percent of the signal cycle has been used for northbound right turns on red, and still 2 percent more of the right turns will be allowed to occur on the red if there is unused eastbound through green time.

For purpose of this example, assume that the westbound through green is critical, and that 15 percent of the signal cycle is unused by eastbound through traffic. Thus, 2 percent more of the signal cycle can be used by the northbound right turns on red since there is 15 seconds of unused green time being given to the eastbound through traffic.

At this point, 8 percent of the signal cycle was available to serve northbound right turning vehicles on red, and 15 percent of the signal cycle was available to serve right turning vehicles on the northbound through green. So 23 percent of the signal cycle has been available for northbound right turns.

Because 40 percent of the signal cycle is needed to serve northbound right turns, there is still a need for 17 percent more of the signal cycle to be available for northbound right turns. What this means is the northbound through traffic green time is increased by 17 percent of the cycle length to serve the unserved right turn volume, and a 17 percent adjustment is added to the Intersection Capacity Utilization to account for the northbound right turns that were not served on the northbound through green time or when right turns on red were assumed.

Separate Right Turn Arrow, With Right Turns on Red

A right turn lane with a separate right turn arrow, plus a certain percentage of right turns allowed on red is calculated the same way as a standard right turn lane with a certain percentage of right turns allowed on red, except the turns which occur on the right turn arrow are not counted as part of the percentage of right turns that occur on red.

Critical Lane Method

Intersection Capacity Utilization parallels another calculation procedure known as the Critical Lane Method with one exception. Critical Lane Method dimensions capacity in terms of standardized vehicles per hour per lane. A Critical Lane Method result of 800 vehicles per hour means that the intersection operates as though 800 vehicles were using a single lane continuously. If one assumes a lane capacity of 1,600 vehicles per hour, then a Critical Lane Method calculation resulting in 800 vehicles per hour is the same as an Intersection Capacity Utilization calculation of 50 percent since 800/1,600 is 50 percent. It is our opinion that the Critical Lane Method is inferior to the Intersection Capacity Utilization method simply because a statement such as "The Critical Lane Method value is 800 vehicles per hour" means little to most persons, whereas a statement such as "The Intersection Capacity Utilization is 50 percent" communicates clearly. Critical Lane Method results directly correspond to Intersection Capacity Utilization results. The correspondence is as follows, assuming a lane capacity of 1,600 vehicles per hour and no clearance interval.

Critical Lane Method Method Result	Intersection Capacity Utilization Result
800 vehicles per hour	50 percent
960 vehicles per hour	60 percent
1,120 vehicles per hour	70 percent
1,280 vehicles per hour	80 percent
1,440 vehicles per hour	90 percent
1,600 vehicles per hour	100 percent
1,760 vehicles per hour	110 percent

INTERSECTION CAPACITY UTILIZATION
LEVEL OF SERVICE DESCRIPTION[1]

Level of Service	Description	Volume to Capacity Ratio
A	Level of Service A occurs when progression is extremely favorable and vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0.600 and below
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average delay.	0.601 to 0.700
C	Level of Service C generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	0.701 to 0.800
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	0.801 to 0.900
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent.	0.901 to 1.000
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs when oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	1.001 and up

[1]Source: Highway Capacity Manual Special Report 209, Transportation Research Board, National Research Council Washington D.C., 2000.

Existing

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---------------------------------------------------------------------------------
                              Rowland Heights Plaza
                                    Existing
                            Weekday Morning Peak Hour
---------------------------------------------------------------------------------

                         Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*********************************************************************************
Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1
*********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):        0.657
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100              Level Of Service:                 B
*********************************************************************************
Street Name:               Fullerton Road                   Gale Avenue
Approach:        North Bound       South Bound       East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|-----------------||-----------------||-----------------||-----------------|
Control:        Protected         Protected         Protected         Protected
Rights:            Ovl              Include             Ovl             Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:         2  0  2  0  1   1  0  2  1  0   1  0  2  0  1   1  0  1  1  0
------------|-----------------||-----------------||-----------------||-----------------|
Volume Module:
Base Vol:      476  875   186    35  373   147   163  203   186    50  350    40
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   476  875   186    35  373   147   163  203   186    50  350    40
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:    511  939   200    38  400   158   175  218   200    54  376    43
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   511  939   200    38  400   158   175  218   200    54  376    43
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   511  939   200    38  400   158   175  218   200    54  376    43
OvlAdjVol:                146                                   0
------------|-----------------||-----------------||-----------------||-----------------|
Saturation Flow Module:
Sat/Lane:     1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:   0.90 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:        2.00 2.00  1.00  1.00 2.15  0.85  1.00 2.00  1.00  1.00 1.79  0.21
Final Sat.:   2880 3200  1600  1600 3443  1357  1600 3200  1600  1600 2872   328
------------|-----------------||-----------------||-----------------||-----------------|
Capacity Analysis Module:
Vol/Sat:      0.18 0.29  0.12  0.02 0.12  0.12  0.11 0.07  0.12  0.03 0.13  0.13
OvlAdjV/S:               0.09                               0.00
Crit Moves:        ****        ****              ****                   ****
*********************************************************************************
```

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--------------------------------------------------------------------------------
                         Rowland Heights Plaza
                               Existing
                        Weekday Evening Peak Hour
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):        0.649
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100               Level Of Service:                 B
********************************************************************************
Street Name:             Fullerton Road                   Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:            Ovl            Include            Ovl            Include
Min. Green:    0     0     0   0     0     0   0     0     0   0     0     0
Lanes:         2  0  2  0  1   1  0  2  1  0   1  0  2  0  1   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      342   531   142    52   494   177   226   477   397   172   331    56
Growth Adj:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   342   531   142    52   494   177   226   477   397   172   331    56
User Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:      0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95
PHF Volume:    360   560   150    55   521   187   238   503   418   181   349    59
Reduct Vol:      0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   360   560   150    55   521   187   238   503   418   181   349    59
PCE Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:   360   560   150    55   521   187   238   503   418   181   349    59
OvlAdjVol:                   0                                   218
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:   0.90  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:        2.00  2.00  1.00  1.00  2.21  0.79  1.00  2.00  1.00  1.00  1.71  0.29
Final Sat.:   2880  3200  1600  1600  3534  1266  1600  3200  1600  1600  2737   463
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.13  0.17  0.09  0.03  0.15  0.15  0.15  0.16  0.26  0.11  0.13  0.13
OvlAdjV/S:                0.00                                  0.14
Crit Moves:   ****                    ****    ****                        ****
********************************************************************************
```

Rowland Heights Plaza
Existing
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1

Cycle (sec):	100	Critical Vol./Cap.(X):	0.792
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Fullerton Road						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Ovl			Include			Ovl			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0 2 0 1			1 0 2 1 0			1 0 2 0 1			1 0 1 1 0		
Volume Module:												
Base Vol:	592	376	271	46	414	320	235	415	507	176	334	45
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	592	376	271	46	414	320	235	415	507	176	334	45
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	611	388	280	47	427	330	243	428	523	182	345	46
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	611	388	280	47	427	330	243	428	523	182	345	46
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	611	388	280	47	427	330	243	428	523	182	345	46
OvlAdjVol:			98						184			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.76	0.24
Final Sat.:	2880	3200	1600	1600	3200	1600	1600	3200	1600	1600	2820	380
Capacity Analysis Module:												
Vol/Sat:	0.21	0.12	0.17	0.03	0.13	0.21	0.15	0.13	0.33	0.11	0.12	0.12
OvlAdjV/S:			0.06						0.11			
Crit Moves:	****					****	****				****	

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--------------------------------------------------------------------------------
                            Rowland Heights Plaza
                                  Existing
                          Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.537
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100              Level Of Service:                  A
********************************************************************************
Street Name:                Fullerton Road              SR-60 Freeway WB Ramps
Approach:        North Bound      South Bound       East Bound        West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted         Permitted         Permitted
Rights:            Ignore          Include           Include           Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  3  0  1   0  0  3  0  0   0  0  0  0  0   1  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1004   323    0  604     0     0     0     0   391     0   573
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1004   323    0  604     0     0     0     0   391     0   573
User Adj:    1.00 1.00  0.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.00 0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:     0 1069     0    0  643     0     0     0     0   416     0   610
Reduct Vol:     0    0     0    0    0     0     0     0     0     0     0     0
Reduced Vol:    0 1069     0    0  643     0     0     0     0   416     0   610
PCE Adj:     1.00 1.00  0.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 1069     0    0  643     0     0     0     0   416     0   610
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600 1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 3.00  1.00 0.00 3.00  0.00  0.00 0.00  0.00  1.21 0.01  1.78
Final Sat.:     0 4800  1600    0 4800     0     0     0     0  1947     0  2853
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.22  0.00 0.00 0.13  0.00  0.00 0.00  0.00  0.21 0.00  0.21
Crit Moves:       ****       ****                                ****
********************************************************************************
```

Rowland Heights Plaza
Existing
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2

Cycle (sec):	100	Critical Vol./Cap.(X):	0.471
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Fullerton Road						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	3 0	1	0 0	3 0	0	0 0	0 0	0	1 0	1! 0	1
Volume Module:												
Base Vol:	0	709	532	0	1049	0	0	0	0	368	0	334
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	709	532	0	1049	0	0	0	0	368	0	334
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.00	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	0	721	0	0	1067	0	0	0	0	374	0	340
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	721	0	0	1067	0	0	0	0	374	0	340
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	721	0	0	1067	0	0	0	0	374	0	340
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	0.00	3.00	0.00	0.00	0.00	0.00	1.57	xxxx	1.43
Final Sat.:	0	4800	1600	0	4800	0	0	0	0	2516	0	2284
Capacity Analysis Module:												
Vol/Sat:	0.00	0.15	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.15	0.00	0.15
Crit Moves:	****				****					****		

```
-------------------------------------------------------------------------------
                         Rowland Heights Plaza
                               Existing
                          Saturday Peak Hour
-------------------------------------------------------------------------------
                   Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*******************************************************************************
Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2
*******************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):        0.566
Loss Time (sec):       10 (Y+R=0.0 sec)   Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100                 Level Of Service:                 A
*******************************************************************************
Street Name:             Fullerton Road               SR-60 Freeway WB Ramps
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Ignore           Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        0  0  3  0  1   0  0  3  0  0   0  0  0  0  0   1  0  1!  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0   744   579     0 1097     0     0     0     0   549     0   494
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0   744   579     0 1097     0     0     0     0   549     0   494
User Adj:    1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.00  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    0   778     0     0 1147     0     0     0     0   574     0   517
Reduct Vol:    0     0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:   0   778     0     0 1147     0     0     0     0   574     0   517
PCE Adj:     1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   0   778     0     0 1147     0     0     0     0   574     0   517
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 3.00  1.00  0.00 3.00  0.00  0.00 0.00  0.00  1.58 xxxx  1.42
Final Sat.:    0  4800  1600     0 4800     0     0     0     0  2527     0  2273
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.16  0.00  0.00 0.24  0.00  0.00 0.00  0.00  0.23 0.00  0.23
Crit Moves:  ****                    ****                          ****
*******************************************************************************
```

Rowland Heights Plaza
Existing
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3

Cycle (sec):	100	Critical Vol./Cap.(X):	0.663
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Fullerton Road						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Ignore			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	1	1 0	1 0	2	0 1	1 1	0	0 1	2 0	0	0 1
Volume Module:												
Base Vol:	0	1278	15	12	684	217	410	10	552	5	0	18
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1278	15	12	684	217	410	10	552	5	0	18
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.00	0.98	0.98	0.00	0.98	0.98	0.98
PHF Volume:	0	1299	15	12	695	0	417	10	0	5	0	18
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1299	15	12	695	0	417	10	0	5	0	18
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	0	1299	15	12	695	0	417	10	0	5	0	18
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00
Lanes:	0.00	1.98	0.02	1.00	2.00	1.00	1.95	0.05	1.00	2.00	0.00	1.00
Final Sat.:	0	3163	37	1600	3200	1600	3124	76	1600	2880	0	1600
Capacity Analysis Module:												
Vol/Sat:	0.00	0.41	0.41	0.01	0.22	0.00	0.13	0.13	0.00	0.00	0.00	0.01
Crit Moves:		****		****				****				****

Rowland Heights Plaza
Existing
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3

Cycle (sec):	100	Critical Vol./Cap.(X):	0.657
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Fullerton Road		SR-60 Freeway EB Ramps	
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Permitted	Protected	Split Phase	Split Phase
Rights:	Include	Ignore	Ignore	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	0 0 1 1 0	1 0 2 0 1	1 1 0 0 1	2 0 0 0 1

	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Volume Module:												
Base Vol:	0	1259	36	44	834	265	201	17	538	31	0	57
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1259	36	44	834	265	201	17	538	31	0	57
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.00	0.96	0.96	0.00	0.96	0.96	0.96
PHF Volume:	0	1309	37	46	867	0	209	18	0	32	0	59
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1309	37	46	867	0	209	18	0	32	0	59
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	0	1309	37	46	867	0	209	18	0	32	0	59
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00
Lanes:	0.00	1.94	0.06	1.00	2.00	1.00	1.84	0.16	1.00	2.00	0.00	1.00
Final Sat.:	0	3111	89	1600	3200	1600	2950	250	1600	2880	0	1600
Capacity Analysis Module:												
Vol/Sat:	0.00	0.42	0.42	0.03	0.27	0.00	0.07	0.07	0.00	0.01	0.00	0.04
Crit Moves:		****		****				****				****

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--------------------------------------------------------------------------------
                           Rowland Heights Plaza
                                 Existing
                            Saturday Peak Hour
--------------------------------------------------------------------------------

                     Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):          0.847
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100              Level Of Service:                   D
********************************************************************************
Street Name:              Fullerton Road                SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Protected        Split Phase       Split Phase
Rights:           Include          Ignore           Ignore            Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  0  1  1  0    1  0  2  0  1    1  1  0  0  1    2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1413   81    121  917  373    255   66  567     60    0  131
Growth Adj:  1.00 1.00 1.00   1.00 1.00 1.00   1.00 1.00 1.00   1.00 1.00 1.00
Initial Bse:    0 1413   81    121  917  373    255   66  567     60    0  131
User Adj:    1.00 1.00 1.00   1.00 1.00 0.00   1.00 1.00 0.00   1.00 1.00 1.00
PHF Adj:     0.97 0.97 0.97   0.97 0.97 0.00   0.97 0.97 0.00   0.97 0.97 0.97
PHF Volume:     0 1457   84    125  945    0    263   68    0     62    0  135
Reduct Vol:     0    0    0      0    0    0      0    0    0      0    0    0
Reduced Vol:    0 1457   84    125  945    0    263   68    0     62    0  135
PCE Adj:     1.00 1.00 1.00   1.00 1.00 0.00   1.00 1.00 0.00   1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00   1.00 1.00 0.00   1.00 1.00 0.00   1.00 1.00 1.00
FinalVolume:    0 1457   84    125  945    0    263   68    0     62    0  135
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600 1600   1600 1600 1600   1600 1600 1600   1600 1600 1600
Adjustment:  1.00 1.00 1.00   1.00 1.00 1.00   1.00 1.00 1.00   0.90 1.00 1.00
Lanes:       0.00 1.89 0.11   1.00 2.00 1.00   1.59 0.41 1.00   2.00 0.00 1.00
Final Sat.:     0 3027  173   1600 3200 1600   2542  658 1600   2880    0 1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.48 0.48   0.08 0.30 0.00   0.10 0.10 0.00   0.02 0.00 0.08
Crit Moves:       ****        ****                  ****                    ****
********************************************************************************
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Rowland Heights Plaza
Existing
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

****

Intersection #4 Fullerton Road (NS) at Colima Road (EW)

****

Cycle (sec):	100	Critical Vol./Cap.(X):	0.773
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	C

****

Street Name:	Fullerton Road						Colima Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	1 1	0	2 0	1 1	0	2 0	2 1	0	2 0	2 1	0
Volume Module:												
Base Vol:	291	771	68	198	841	151	95	368	144	179	739	264
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	291	771	68	198	841	151	95	368	144	179	739	264
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	300	795	70	204	867	156	98	379	148	185	762	272
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	300	795	70	204	867	156	98	379	148	185	762	272
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	300	795	70	204	867	156	98	379	148	185	762	272
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00
Lanes:	2.00	1.84	0.16	2.00	1.70	0.30	2.00	2.16	0.84	2.00	2.21	0.79
Final Sat.:	2880	2941	259	2880	2713	487	2880	3450	1350	2880	3537	1263
Capacity Analysis Module:												
Vol/Sat:	0.10	0.27	0.27	0.07	0.32	0.32	0.03	0.11	0.11	0.06	0.22	0.22
Crit Moves:	****				****		****				****	

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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                       Weekday Evening Peak Hour
--------------------------------------------------------------------------------

                   Level Of Service Computation Report
     ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #4 Fullerton Road (NS) at Colima Road (EW)
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.825
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  D
********************************************************************************
Street Name:              Fullerton Road                    Colima Road
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        2  0  1  1  0   2  0  1  1  0   2  0  2  1  0   2  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     267  706    85   400  755   151   172 1029   144   209  720   213
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  267  706    85   400  755   151   172 1029   144   209  720   213
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:   275  728    88   412  778   156   177 1061   148   215  742   220
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  275  728    88   412  778   156   177 1061   148   215  742   220
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  275  728    88   412  778   156   177 1061   148   215  742   220
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  0.90 1.00  1.00  0.90 1.00  1.00  0.90 1.00  1.00  0.90 1.00  1.00
Lanes:       2.00 1.79  0.21  2.00 1.67  0.33  2.00 2.63  0.37  2.00 2.32  0.68
Final Sat.:  2880 2856   344  2880 2667   533  2880 4211   589  2880 3704  1096
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.25  0.25  0.14 0.29  0.29  0.06 0.25  0.25  0.07 0.20  0.20
Crit Moves:       ****        ****                   ****        ****
********************************************************************************
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Rowland Heights Plaza
Existing
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #4 Fullerton Road (NS) at Colima Road (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.841
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	D

Street Name:	Fullerton Road						Colima Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	1 1	0	2 0	1 1	0	2 0	2 1	0	2 0	2 1	0
Volume Module:												
Base Vol:	280	532	101	397	610	263	263	951	162	220	972	312
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	280	532	101	397	610	263	263	951	162	220	972	312
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	285	541	103	404	621	268	268	967	165	224	989	317
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	285	541	103	404	621	268	268	967	165	224	989	317
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	285	541	103	404	621	268	268	967	165	224	989	317
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00
Lanes:	2.00	1.68	0.32	2.00	1.40	0.60	2.00	2.56	0.44	2.00	2.27	0.73
Final Sat.:	2880	2689	511	2880	2236	964	2880	4101	699	2880	3634	1166
Capacity Analysis Module:												
Vol/Sat:	0.10	0.20	0.20	0.14	0.28	0.28	0.09	0.24	0.24	0.08	0.27	0.27
Crit Moves:	****				****		****				****	

Rowland Heights Plaza
Existing
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #5 Coiner Court (NS) at Gale Avenue (EW) - #5

Cycle (sec): 100 | Critical Vol./Cap.(X): 0.336
Loss Time (sec): 10 (Y+R=0.0 sec) | Average Delay (sec/veh): xxxxxx
Optimal Cycle: 100 | Level Of Service: A

Street Name:	Coiner Court						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0	0 0	1 0	0	0 1	1 0	2	0 0	0 0	1	1 0
Volume Module:												
Base Vol:	0	0	0	12	0	4	46	158	0	0	500	64
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	12	0	4	46	158	0	0	500	64
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	0	0	0	13	0	4	51	176	0	0	556	71
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	13	0	4	51	176	0	0	556	71
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	13	0	4	51	176	0	0	556	71
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	1.77	0.23
Final Sat.:	0	0	0	1600	0	1600	1600	3200	0	0	2837	363
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.01	0.00	0.00	0.03	0.05	0.00	0.00	0.20	0.20
Crit Moves:				****			****				****	

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---------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                        Weekday Evening Peak Hour
---------------------------------------------------------------------------
                    Level Of Service Computation Report
     ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
***************************************************************************
Intersection #5 Coiner Court (NS) at Gale Avenue (EW) - #5
***************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.427
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       100              Level Of Service:                  A
***************************************************************************
Street Name:            Coiner Court                     Gale Avenue
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        0  0  0  0  0   1  0  0  0  1   1  0  2  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0     0     0  117     0    47   13   693     0    0   390    22
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   0     0     0  117     0    47   13   693     0    0   390    22
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89  0.89
PHF Volume:    0     0     0  132     0    53   15   783     0    0   441    25
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   0     0     0  132     0    53   15   783     0    0   441    25
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:   0     0     0  132     0    53   15   783     0    0   441    25
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       0.00  0.00  0.00 1.00  0.00  1.00 1.00  2.00  0.00 0.00  1.89  0.11
Final Sat.:    0     0     0  1600    0  1600 1600  3200     0    0  3029   171
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00 0.08  0.00  0.03 0.01  0.24  0.00 0.00  0.15  0.15
Crit Moves:                   ****                   ****       ****
***************************************************************************
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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                           Saturday Peak Hour
--------------------------------------------------------------------------------

                   Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Coiner Court (NS) at Gale Avenue (EW) - #5
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.329
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100              Level Of Service:                  A
********************************************************************************
Street Name:              Coiner Court                  Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:          Permitted        Permitted        Permitted        Permitted
Rights:            Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:          0  0  0  0  0    1  0  0  0  1    1  0  2  0  0    0  0  1  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:       0     0     0   17     0    18   17   655     0    0   482    14
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:    0     0     0   17     0    18   17   655     0    0   482    14
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94
PHF Volume:     0     0     0   18     0    19   18   697     0    0   513    15
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:    0     0     0   18     0    19   18   697     0    0   513    15
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:    0     0     0   18     0    19   18   697     0    0   513    15
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       0.00  0.00  0.00 1.00  0.00  1.00 1.00  2.00  0.00 0.00  1.94  0.06
Final Sat.:     0     0     0 1600     0  1600 1600  3200     0    0  3110    90
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00 0.01  0.00  0.01 0.01  0.22  0.00 0.00  0.16  0.16
Crit Moves:                   ****                    ****       ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                             Rowland Heights Plaza
                                   Existing
                           Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.308
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100              Level Of Service:                  A
********************************************************************************
Street Name:       Project Central Access                Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  1! 0  0    0  0  0  0  0    0  0  1  1  0    1  0  2  0  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:        3     0     8     0     0     0     0   159     4     4   595     0
Growth Adj:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:     3     0     8     0     0     0     0   159     4     4   595     0
User Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:      0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93
PHF Volume:      3     0     9     0     0     0     0   171     4     4   640     0
Reduct Vol:      0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:     3     0     9     0     0     0     0   171     4     4   640     0
PCE Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:     3     0     9     0     0     0     0   171     4     4   640     0
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:     1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:        0.27  0.00  0.73  0.00  0.00  0.00  0.00  1.95  0.05  1.00  2.00  0.00
Final Sat.:    436     0  1164     0     0     0     0  3121    79  1600  3200     0
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:      0.00  0.00  0.01  0.00  0.00  0.00  0.00  0.05  0.05  0.00  0.20  0.00
Crit Moves:               ****              ****                          ****
********************************************************************************
```

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------------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                        Weekday Evening Peak Hour
------------------------------------------------------------------------------
                     Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
******************************************************************************
Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7
******************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):          0.380
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100                Level Of Service:                   A
******************************************************************************
Street Name:       Project Central Access               Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       0  0  1! 0  0   0  0  0  0  0   0  0  1  1  0   1  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       7    0    6    0    0    0    0  800    1    3  412    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:    7    0    6    0    0    0    0  800    1    3  412    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume:     8    0    6    0    0    0    0  861    1    3  443    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:    8    0    6    0    0    0    0  861    1    3  443    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:    8    0    6    0    0    0    0  861    1    3  443    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       0.54 0.00 0.46 0.00 0.00 0.00 0.00 1.99 0.01 1.00 2.00 0.00
Final Sat.:   862    0  738    0    0    0    0 3196    4 1600 3200    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.01 0.00 0.00 0.00 0.00 0.27 0.27 0.00 0.14 0.00
Crit Moves:            ****                        ****      ****
******************************************************************************
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-----------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                           Saturday Peak Hour
-----------------------------------------------------------------------------

                     Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*****************************************************************************
Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7
*****************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.331
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100              Level Of Service:                  A
*****************************************************************************
Street Name:       Project Central Access                Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  1! 0  0   0  0  0  0  0   0  0  1  1  0   1  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      4     0     5    0     0     0    0   665     3    9   508     0
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   4     0     5    0     0     0    0   665     3    9   508     0
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95
PHF Volume:    4     0     5    0     0     0    0   699     3    9   534     0
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   4     0     5    0     0     0    0   699     3    9   534     0
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:   4     0     5    0     0     0    0   699     3    9   534     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       0.44  0.00  0.56 0.00  0.00  0.00 0.00  1.99  0.01 1.00  2.00  0.00
Final Sat.:   711     0   889    0     0     0    0  3186    14 1600  3200     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.01 0.00  0.00  0.00 0.00  0.22  0.22 0.01  0.17  0.00
Crit Moves:              ****                        ****       ****
*****************************************************************************
```

Rowland Heights Plaza
Existing
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 Project East Access (NS) at Gale Avenue (EW) - #8

Cycle (sec):	100	Critical Vol./Cap.(X):	0.316
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Project East Access						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	1!	0 0	0 1	0	0 1	1 0	1	1 0	1 0	1	1 0
Volume Module:												
Base Vol:	1	0	1	11	0	2	16	167	0	0	599	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	0	1	11	0	2	16	167	0	0	599	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	1	0	1	12	0	2	17	176	0	0	631	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1	0	1	12	0	2	17	176	0	0	631	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1	0	1	12	0	2	17	176	0	0	631	3
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.50	0.00	0.50	1.00	0.00	1.00	1.00	2.00	0.00	1.00	1.99	0.01
Final Sat.:	800	0	800	1600	0	1600	1600	3200	0	1600	3184	16
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.05	0.00	0.00	0.20	0.20
Crit Moves:		****		****			****				****	

Rowland Heights Plaza
Existing
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 Project East Access (NS) at Gale Avenue (EW) - #8

Cycle (sec):	100	Critical Vol./Cap.(X):	0.411
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Project East Access						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	1!	0 0	0 1	0	0 1	1 0	1	1 0	1 0	1	1 0
Volume Module:												
Base Vol:	1	0	1	72	0	74	105	800	0	0	419	21
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	0	1	72	0	74	105	800	0	0	419	21
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	1	0	1	76	0	78	111	842	0	0	441	22
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1	0	1	76	0	78	111	842	0	0	441	22
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1	0	1	76	0	78	111	842	0	0	441	22
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.50	0.00	0.50	1.00	0.00	1.00	1.00	2.00	0.00	1.00	1.90	0.10
Final Sat.:	800	0	800	1600	0	1600	1600	3200	0	1600	3047	153
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.05	0.00	0.05	0.07	0.26	0.00	0.00	0.14	0.14
Crit Moves:		****		****				****		****		

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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                           Saturday Peak Hour
--------------------------------------------------------------------------------

                   Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #8 Project East Access (NS) at Gale Avenue (EW) - #8
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.430
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  A
********************************************************************************
Street Name:        Project East Access                 Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  1! 0  0   0  1  0  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      1     0     1   93     0    96  136   672     0    0   517    27
Growth Adj: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   1     0     1   93     0    96  136   672     0    0   517    27
User Adj:   1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:    0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95
PHF Volume:    1     0     1   98     0   101  143   707     0    0   544    28
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   1     0     1   98     0   101  143   707     0    0   544    28
PCE Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:   1     0     1   98     0   101  143   707     0    0   544    28
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:      0.50  0.00  0.50 1.00  0.00  1.00 1.00  2.00  0.00 1.00  1.90  0.10
Final Sat.:  800     0   800 1600     0  1600 1600  3200     0 1600  3041   159
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00  0.00  0.00 0.06  0.00  0.06 0.09  0.22  0.00 0.00  0.18  0.18
Crit Moves:       ****       ****             ****                    ****
********************************************************************************
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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                        Weekday Morning Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
         ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #9 Nogales Street (NS) at Shadow Oak Drive (EW) - #9
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.666
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  B
********************************************************************************
Street Name:              Nogales Street                Shadow Oak Drive
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected         Permitted        Permitted
Rights:          Include          Include           Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  2  0  1   1  0  2  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     134  741   126    45  681    28    52  101   194   188   97    96
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  134  741   126    45  681    28    52  101   194   188   97    96
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:   142  783   133    48  720    30    55  107   205   199  103   101
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  142  783   133    48  720    30    55  107   205   199  103   101
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  142  783   133    48  720    30    55  107   205   199  103   101
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 2.00  1.00  1.00 2.00  1.00  1.00 1.00  1.00  1.00 1.01  0.99
Final Sat.:  1600 3200  1600  1600 3200  1600  1600 1600  1600  1600 1608  1592
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.09 0.24  0.08  0.03 0.22  0.02  0.03 0.07  0.13  0.12 0.06  0.06
Crit Moves:  ****                  ****                    ****  ****
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--------------------------------------------------------------------------------
                           Rowland Heights Plaza
                                Existing
                         Weekday Evening Peak Hour
--------------------------------------------------------------------------------

                     Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #9 Nogales Street (NS) at Shadow Oak Drive (EW) - #9
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.518
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  A
********************************************************************************
Street Name:              Nogales Street                 Shadow Oak Drive
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         1  0  2  0  1   1  0  2  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      134  814   138    41  662    51    38   61   102    77   45    31
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   134  814   138    41  662    51    38   61   102    77   45    31
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    139  846   143    43  688    53    40   63   106    80   47    32
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   139  846   143    43  688    53    40   63   106    80   47    32
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   139  846   143    43  688    53    40   63   106    80   47    32
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:        1.00 2.00  1.00  1.00 2.00  1.00  1.00 1.00  1.00  1.00 1.18  0.82
Final Sat.:   1600 3200  1600  1600 3200  1600  1600 1600  1600  1600 1895  1305
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.09 0.26  0.09  0.03 0.22  0.03  0.02 0.04  0.07  0.05 0.02  0.02
Crit Moves:   ****                  ****                    ****  ****
********************************************************************************
```

Rowland Heights Plaza
Existing
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #9 Nogales Street (NS) at Shadow Oak Drive (EW) - #9

Cycle (sec):	100	Critical Vol./Cap.(X):	0.522
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Nogales Street						Shadow Oak Drive					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2 0	1	1 0	2 0	1	1 0	1 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	106	703	91	18	664	38	37	23	136	86	20	30
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	106	703	91	18	664	38	37	23	136	86	20	30
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	108	719	93	18	679	39	38	24	139	88	20	31
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	108	719	93	18	679	39	38	24	139	88	20	31
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	108	719	93	18	679	39	38	24	139	88	20	31
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	1600	1600	1600	1600	1600
Capacity Analysis Module:												
Vol/Sat:	0.07	0.22	0.06	0.01	0.21	0.02	0.02	0.01	0.09	0.05	0.01	0.02
Crit Moves:	****				****				****	****		

Rowland Heights Plaza
Existing
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #10 Nogales Street (NS) at La Puente Road (EW) - #10

Cycle (sec):	100	Critical Vol./Cap.(X):	0.818
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	D

Street Name:	Nogales Street						La Puente Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 2 0 1			1 0 2 0 1			0 0 1! 0 0			0 1 0 0 1		
Volume Module:												
Base Vol:	32	632	147	126	991	118	91	41	36	280	39	163
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	32	632	147	126	991	118	91	41	36	280	39	163
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
PHF Volume:	36	716	166	143	1122	134	103	46	41	317	44	185
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	36	716	166	143	1122	134	103	46	41	317	44	185
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	36	716	166	143	1122	134	103	46	41	317	44	185
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	0.55	0.24	0.21	0.88	0.12	1.00
Final Sat.:	1600	3200	1600	1600	3200	1600	867	390	343	1404	196	1600
Capacity Analysis Module:												
Vol/Sat:	0.02	0.22	0.10	0.09	0.35	0.08	0.12	0.12	0.12	0.23	0.23	0.12
Crit Moves:	****				****			****		****		

Rowland Heights Plaza
Existing
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #10 Nogales Street (NS) at La Puente Road (EW) - #10

Cycle (sec):	100	Critical Vol./Cap.(X):	0.774
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						La Puente Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2 0	1	1 0	2 0	1	0 0	1! 0	0	0 1	0 0	1
Volume Module:												
Base Vol:	2	966	391	206	597	45	69	33	17	225	20	158
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	966	391	206	597	45	69	33	17	225	20	158
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	2	989	400	211	611	46	71	34	17	230	20	162
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2	989	400	211	611	46	71	34	17	230	20	162
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	2	989	400	211	611	46	71	34	17	230	20	162
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	0.58	0.28	0.14	0.92	0.08	1.00
Final Sat.:	1600	3200	1600	1600	3200	1600	928	444	229	1469	131	1600
Capacity Analysis Module:												
Vol/Sat:	0.00	0.31	0.25	0.13	0.19	0.03	0.08	0.08	0.08	0.16	0.16	0.10
Crit Moves:		****		****					****	****		

Rowland Heights Plaza
Existing
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #10 Nogales Street (NS) at La Puente Road (EW) - #10

Cycle (sec):	100	Critical Vol./Cap.(X):	0.774
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						La Puente Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2 0	1	1 0	2 0	1	0 0	1! 0	0	0 1	0 0	1
Volume Module:												
Base Vol:	8	760	246	191	767	1	26	14	34	390	1	158
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	8	760	246	191	767	1	26	14	34	390	1	158
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	8	791	256	199	798	1	27	15	35	406	1	164
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	791	256	199	798	1	27	15	35	406	1	164
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	8	791	256	199	798	1	27	15	35	406	1	164
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	0.35	0.19	0.46	0.99	0.01	1.00
Final Sat.:	1600	3200	1600	1600	3200	1600	562	303	735	1596	4	1600
Capacity Analysis Module:												
Vol/Sat:	0.01	0.25	0.16	0.12	0.25	0.00	0.05	0.05	0.05	0.25	0.25	0.10
Crit Moves:		****		****					****		****	

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                        Rowland Heights Plaza
                              Existing
                      Weekday Morning Peak Hour
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                    Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #11 Nogales Street  (NS) at Valley Boulevard Loop (EW) - #11
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.638
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100                Level Of Service:                  B
********************************************************************************
Street Name:               Nogales Street                Valley Boulevard Loop
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0     0    0    0     0    0    0
Lanes:       1  0  2  1  0   1  0  2  1  0   0  0  1! 0  0   1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      32  634   146    88 1132   156    48   18    32   180    1   222
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   32  634   146    88 1132   156    48   18    32   180    1   222
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:    35  699   161    97 1248   172    53   20    35   198    1   245
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   35  699   161    97 1248   172    53   20    35   198    1   245
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   35  699   161    97 1248   172    53   20    35   198    1   245
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 2.44  0.56  1.00 2.64  0.36  0.49 0.18  0.33  1.99 0.01  1.00
Final Sat.:  1600 3902   898  1600 4219   581   784  294   522  3182   18  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.18  0.18  0.06 0.30  0.30  0.07 0.07  0.07  0.06 0.06  0.15
Crit Moves:  ****                  ****             ****                     ****
********************************************************************************
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Rowland Heights Plaza
Existing
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #11 Nogales Street (NS) at Valley Boulevard Loop (EW) - #11

Cycle (sec):	100	Critical Vol./Cap.(X):	0.630
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Nogales Street						Valley Boulevard Loop					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2	1 0	1 0	2	1 0	0 0	1!	0 0	1 1	0	0 1
Volume Module:												
Base Vol:	16	1225	222	74	622	43	30	4	13	121	2	211
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	16	1225	222	74	622	43	30	4	13	121	2	211
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	17	1276	231	77	648	45	31	4	14	126	2	220
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	17	1276	231	77	648	45	31	4	14	126	2	220
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	17	1276	231	77	648	45	31	4	14	126	2	220
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.54	0.46	1.00	2.81	0.19	0.64	0.08	0.28	1.97	0.03	1.00
Final Sat.:	1600	4064	736	1600	4490	310	1021	136	443	3148	52	1600
Capacity Analysis Module:												
Vol/Sat:	0.01	0.31	0.31	0.05	0.14	0.14	0.03	0.03	0.03	0.04	0.04	0.14
Crit Moves:		****		****				****				****

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------------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                           Saturday Peak Hour
------------------------------------------------------------------------------

                    Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*******************************************************************************
Intersection #11 Nogales Street  (NS) at Valley Boulevard Loop (EW) - #11
*******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.533
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  A
*******************************************************************************
Street Name:             Nogales Street                Valley Boulevard Loop
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:       Protected        Protected       Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       1  0  2  1  0   1  0  2  1  0   0  0  1! 0  0   1  1  0  0  1
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      22 1004   122    86 1094    68    29     2    20   154     2   160
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   22 1004   122    86 1094    68    29     2    20   154     2   160
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:    23 1035   126    89 1128    70    30     2    21   159     2   165
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:   23 1035   126    89 1128    70    30     2    21   159     2   165
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   23 1035   126    89 1128    70    30     2    21   159     2   165
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 2.67  0.33  1.00 2.82  0.18  0.57 0.04  0.39  1.97 0.03  1.00
Final Sat.:  1600 4280   520  1600 4519   281   910   63   627  3159   41  1600
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.24  0.24  0.06 0.25  0.25  0.03 0.03  0.03  0.05 0.05  0.10
Crit Moves:       ****        ****             ****                         ****
*******************************************************************************
```

```
                         Rowland Heights Plaza
                               Existing
                      Weekday Morning Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*****************************************************************************
Intersection #12 Valley Boulevard Loop (NS) at Valley Boulevard (EW) - #12
*****************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.565
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100                Level Of Service:                  A
*****************************************************************************
Street Name:      Valley Boulevard Loop               Valley Boulevard
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:       0  0  0  0  0   2  0  0  0  1   2  0  3  0  0   0  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0    0    0   101    0  151   181  512    0      0  996  251
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   0    0    0   101    0  151   181  512    0      0  996  251
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90
PHF Volume:    0    0    0   113    0  168   202  571    0      0 1110  280
Reduct Vol:    0    0    0     0    0    0     0    0    0      0    0    0
Reduced Vol:   0    0    0   113    0  168   202  571    0      0 1110  280
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:   0    0    0   113    0  168   202  571    0      0 1110  280
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600
Adjustment:  1.00 1.00 1.00  0.90 1.00 1.00  0.90 1.00 1.00  1.00 1.00 1.00
Lanes:       0.00 0.00 0.00  2.00 0.00 1.00  2.00 3.00 0.00  0.00 2.40 0.60
Final Sat.:    0    0    0  2880    0 1600  2880 4800    0      0 3834  966
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.00  0.04 0.00 0.11  0.07 0.12 0.00  0.00 0.29 0.29
Crit Moves:                              ****  ****                    ****
*****************************************************************************
```

Rowland Heights Plaza
Existing
Weekday Evening Peak Hour

```
                    Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #12 Valley Boulevard Loop (NS) at Valley Boulevard (EW) - #12
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):          0.399
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):        xxxxxx
Optimal Cycle:        100               Level Of Service:                    A
********************************************************************************
Street Name:       Valley Boulevard Loop                  Valley Boulevard
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:         Permitted        Permitted        Protected         Permitted
Rights:           Include          Include          Include           Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  0  0  0  0   2  0  0  0  1   2  0  3  0  0   0  0  2  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:       0    0    0   211    0   90   102 1072    0     0  643  228
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    0    0    0   211    0   90   102 1072    0     0  643  228
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.97 0.97 0.97  0.97 0.97 0.97  0.97 0.97 0.97  0.97 0.97 0.97
PHF Volume:     0    0    0   218    0   93   105 1106    0     0  664  235
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    0    0    0   218    0   93   105 1106    0     0  664  235
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:    0    0    0   218    0   93   105 1106    0     0  664  235
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1600 1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600
Adjustment:  1.00 1.00 1.00  0.90 1.00 1.00  0.90 1.00 1.00  1.00 1.00 1.00
Lanes:       0.00 0.00 0.00  2.00 0.00 1.00  2.00 3.00 0.00  0.00 2.21 0.79
Final Sat.:     0    0    0  2880    0 1600  2880 4800    0     0 3544 1256
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.00  0.08 0.00 0.06  0.04 0.23 0.00  0.00 0.19 0.19
Crit Moves:                  ****            ****                     ****
********************************************************************************
```

Rowland Heights Plaza
Existing
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #12 Valley Boulevard Loop (NS) at Valley Boulevard (EW) - #12

Cycle (sec):	100	Critical Vol./Cap.(X):	0.331
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Valley Boulevard Loop						Valley Boulevard					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 0 0 0			2 0 0 0 1			2 0 3 0 0			0 0 2 1 0		
Volume Module:												
Base Vol:	0	0	0	128	0	87	94	429	0	0	465	188
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	128	0	87	94	429	0	0	465	188
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	0	0	0	133	0	90	97	444	0	0	481	195
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	133	0	90	97	444	0	0	481	195
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	133	0	90	97	444	0	0	481	195
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	2.00	0.00	1.00	2.00	3.00	0.00	0.00	2.14	0.86
Final Sat.:	0	0	0	2880	0	1600	2880	4800	0	0	3418	1382
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.05	0.00	0.06	0.03	0.09	0.00	0.00	0.14	0.14
Crit Moves:						****	****				****	

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------------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                        Weekday Morning Peak Hour
------------------------------------------------------------------------------

                    Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
******************************************************************************
Intersection #13 Nogales Street (NS) at San Jose Avenue (EW) - #13
******************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.641
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100              Level Of Service:                  B
******************************************************************************
Street Name:               Nogales Street                San Jose Avenue
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Prot+Permit        Permitted         Permitted         Permitted
Rights:         Include           Include           Include           Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        1  0  2  1  0   1  0  2  1  0   1  0  0  1  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      226  983  100    69 1153   95     9   58   70    36  148   33
Growth Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   226  983  100    69 1153   95     9   58   70    36  148   33
User Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.10 1.00 1.10  1.10 1.00 1.10
PHF Adj:      0.97 0.97 0.97  0.97 0.97 0.97  0.97 0.97 0.97  0.97 0.97 0.97
PHF Volume:    233 1014  103    71 1190   98    10   60   79    41  153   37
Reduct Vol:      0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   233 1014  103    71 1190   98    10   60   79    41  153   37
PCE Adj:      1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:      1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:   233 1014  103    71 1190   98    10   60   79    41  153   37
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600
Adjustment:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:        1.00 2.72 0.28  1.00 2.77 0.23  1.00 0.43 0.57  0.21 0.79 1.00
Final Sat.:   1600 4357  443  1600 4435  365  1600  687  913   338 1262 1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.15 0.23 0.23  0.04 0.27 0.27  0.01 0.09 0.09  0.03 0.12 0.02
Crit Moves:   ****                  ****      ****                   ****
******************************************************************************
```

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--------------------------------------------------------------------------------
                         Rowland Heights Plaza
                               Existing
                       Weekday Evening Peak Hour
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #13 Nogales Street (NS) at San Jose Avenue (EW) - #13
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):        0.896
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):    xxxxxx
Optimal Cycle:        100              Level Of Service:                 D
********************************************************************************
Street Name:             Nogales Street                San Jose Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|-----------------||---------------||---------------||---------------|
Control:      Prot+Permit        Permitted        Permitted        Permitted
Rights:          Include           Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         1  0  2  1  0   1  0  2  1  0   1  0  0  1  0   0  1  0  0  1
------------|-----------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       60  1208    57    48   891    48   122   309   233    88    87    62
Growth Adj:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:    60  1208    57    48   891    48   122   309   233    88    87    62
User Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.10  1.00  1.10  2.00  1.00  2.00
PHF Adj:      0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95
PHF Volume:     63  1270    60    50   937    50   141   325   270   185    91   130
Reduct Vol:      0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:    63  1270    60    50   937    50   141   325   270   185    91   130
PCE Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:    63  1270    60    50   937    50   141   325   270   185    91   130
------------|-----------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:        1.00  2.86  0.14  1.00  2.85  0.15  1.00  0.55  0.45  0.67  0.33  1.00
Final Sat.:   1600  4584   216  1600  4555   245  1600   875   725  1071   529  1600
------------|-----------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.04  0.28  0.28  0.03  0.21  0.21  0.09  0.37  0.37  0.12  0.17  0.08
Crit Moves:         ****        ****                    ****        ****
********************************************************************************
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------------------------------------------------------------------------------
                           Rowland Heights Plaza
                                 Existing
                            Saturday Peak Hour
------------------------------------------------------------------------------

                     Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
******************************************************************************
Intersection #13 Nogales Street (NS) at San Jose Avenue (EW) - #13
******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.569
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  A
******************************************************************************
Street Name:               Nogales Street                San Jose Avenue
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit       Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  2  1  0   1  0  2  1  0   1  0  0  1  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      77 1027   160    38 1150    53    16   42    33   147   61    64
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   77 1027   160    38 1150    53    16   42    33   147   61    64
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.10 1.00  1.10  1.10 1.00  1.10
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    81 1074   167    40 1203    55    18   44    38   169   64    74
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   81 1074   167    40 1203    55    18   44    38   169   64    74
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   81 1074   167    40 1203    55    18   44    38   169   64    74
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 2.60  0.40  1.00 2.87  0.13  1.00 0.54  0.46  0.73 0.27  1.00
Final Sat.:  1600 4153   647  1600 4589   211  1600  858   742  1162  438  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.26  0.26  0.02 0.26  0.26  0.01 0.05  0.05  0.11 0.15  0.05
Crit Moves:  ****                   ****             ****        ****
******************************************************************************
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-------------------------------------------------------------------------------
                         Rowland Heights Plaza
                               Existing
                      Weekday Morning Peak Hour
-------------------------------------------------------------------------------
                   Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*******************************************************************************
Intersection #14 Nogales Street (NS) at Railroad Street (EW) - #14
*******************************************************************************
Cycle (sec):        100                Critical Vol./Cap.(X):        0.534
Loss Time (sec):     10 (Y+R=0.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:      100                Level Of Service:                 A
*******************************************************************************
Street Name:             Nogales Street                 Railroad Street
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:         1  0  2  1  0   1  0  2  1  0   1  0  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      213 1311    1     1 1230   34     3    0   21     1    0    1
Growth Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   213 1311    1     1 1230   34     3    0   21     1    0    1
User Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:      0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95
PHF Volume:    225 1387    1     1 1302   36     3    0   22     1    0    1
Reduct Vol:      0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   225 1387    1     1 1302   36     3    0   22     1    0    1
PCE Adj:      1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:      1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:   225 1387    1     1 1302   36     3    0   22     1    0    1
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600
Adjustment:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:        1.00 2.99 0.01  1.00 2.92 0.08  1.00 0.00 1.00  0.50 0.00 0.50
Final Sat.:   1600 4796    4  1600 4671  129  1600    0 1600   800    0  800
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.14 0.29 0.29  0.00 0.28 0.28  0.00 0.00 0.01  0.00 0.00 0.00
Crit Moves:   ****                  ****                  ****  ****
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                        Weekday Evening Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #14 Nogales Street (NS) at Railroad Street (EW) - #14
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):          0.459
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100              Level Of Service:                   A
********************************************************************************
Street Name:                Nogales Street                 Railroad Street
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  2  1  0   1  0  2  1  0   1  0  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      21 1300     1     1 1205    23    25    0   117     1    0     1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   21 1300     1     1 1205    23    25    0   117     1    0     1
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    22 1363     1     1 1263    24    26    0   123     1    0     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   22 1363     1     1 1263    24    26    0   123     1    0     1
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   22 1363     1     1 1263    24    26    0   123     1    0     1
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 2.99  0.01  1.00 2.94  0.06  1.00 0.00  1.00  0.50 0.00  0.50
Final Sat.:  1600 4796     4  1600 4710    90  1600    0  1600   800    0   800
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.28  0.28  0.00 0.27  0.27  0.02 0.00  0.08  0.00 0.00  0.00
Crit Moves:  ****                  ****                    ****  ****
********************************************************************************
```

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-------------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                           Saturday Peak Hour
-------------------------------------------------------------------------------

                    Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*******************************************************************************
Intersection #14 Nogales Street (NS) at Railroad Street (EW) - #14
*******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):        0.466
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100               Level Of Service:                 A
*******************************************************************************
Street Name:                 Nogales Street                  Railroad Street
Approach:          North Bound      South Bound       East Bound       West Bound
Movement:        L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:          Permitted         Permitted         Permitted         Permitted
Rights:            Include           Include           Include           Include
Min. Green:      0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         1  0  2  1  0   1  0  2  1  0   1  0  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       64 1248     1     1 1334    27     1     0    37     1     0     1
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    64 1248     1     1 1334    27     1     0    37     1     0     1
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     67 1315     1     1 1406    28     1     0    39     1     0     1
Reduct Vol:      0    0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:    67 1315     1     1 1406    28     1     0    39     1     0     1
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    67 1315     1     1 1406    28     1     0    39     1     0     1
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:        1.00 2.99  0.01  1.00 2.94  0.06  1.00 0.00  1.00  0.50 0.00  0.50
Final Sat.:   1600 4796     4  1600 4705    95  1600     0  1600   800     0   800
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.04 0.27  0.27  0.00 0.30  0.30  0.00 0.00  0.02  0.00 0.00  0.00
Crit Moves:   ****                   ****                   ****  ****
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                            Rowland Heights Plaza
                                  Existing
                          Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #15 Nogales Street (NS) at Gale Avenue/Walnut Drive (EW) - #15
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.820
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100              Level Of Service:                  D
********************************************************************************
Street Name:             Nogales Street             Gale Avenue/Walnut Drive
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Prot+Permit      Prot+Permit
Rights:           Include          Include          Include          Include
Min. Green:   0     0     0   0     0     0   0     0     0   0     0     0
Lanes:        1  0  2  1  0   1  0  2  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     291 1330   168   183  913   146    49   73    55   104  228   146
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  291 1330   168   183  913   146    49   73    55   104  228   146
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:   303 1387   175   191  952   152    51   76    57   108  238   152
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  303 1387   175   191  952   152    51   76    57   108  238   152
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  303 1387   175   191  952   152    51   76    57   108  238   152
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 2.66  0.34  1.00 2.59  0.41  1.00 0.57  0.43  1.00 0.61  0.39
Final Sat.:  1600 4262   538  1600 4138   662  1600  912   688  1600  975   625
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.33  0.33  0.12 0.23  0.23  0.03 0.08  0.08  0.07 0.24  0.24
Crit Moves:       ****        ****             ****                   ****
********************************************************************************
```

Rowland Heights Plaza
Existing
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #15 Nogales Street (NS) at Gale Avenue/Walnut Drive (EW) - #15

Cycle (sec):	100	Critical Vol./Cap.(X):	1.125
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	F

Street Name:	Nogales Street						Gale Avenue/Walnut Drive					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Prot+Permit			Prot+Permit		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2	1 0	1 0	2	1 0	1 0	0	1 0	1 0	0	1 0
Volume Module:												
Base Vol:	217	991	70	120	1088	97	239	341	366	227	236	91
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	217	991	70	120	1088	97	239	341	366	227	236	91
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	230	1051	74	127	1154	103	253	362	388	241	250	97
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	230	1051	74	127	1154	103	253	362	388	241	250	97
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	230	1051	74	127	1154	103	253	362	388	241	250	97
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.80	0.20	1.00	2.75	0.25	1.00	0.48	0.52	1.00	0.72	0.28
Final Sat.:	1600	4483	317	1600	4407	393	1600	772	828	1600	1155	445
Capacity Analysis Module:												
Vol/Sat:	0.14	0.23	0.23	0.08	0.26	0.26	0.16	0.47	0.47	0.15	0.22	0.22
Crit Moves:	****				****			****		****		

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------------------------------------------------------------------------------
                           Rowland Heights Plaza
                                 Existing
                            Saturday Peak Hour
------------------------------------------------------------------------------

                     Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
******************************************************************************
Intersection #15 Nogales Street (NS) at Gale Avenue/Walnut Drive (EW) - #15
******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):          1.002
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100               Level Of Service:                   F
******************************************************************************
Street Name:                Nogales Street              Gale Avenue/Walnut Drive
Approach:         North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:          Protected        Protected       Prot+Permit      Prot+Permit
Rights:            Include          Include          Include          Include
Min. Green:     0     0     0   0     0     0   0     0     0   0     0     0
Lanes:          1  0  2  1  0   1  0  2  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      278 1055    99   100  949   215   202  216   381   149  321    89
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   278 1055    99   100  949   215   202  216   381   149  321    89
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98
PHF Volume:    284 1079   101   102  970   220   207  221   390   152  328    91
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   284 1079   101   102  970   220   207  221   390   152  328    91
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   284 1079   101   102  970   220   207  221   390   152  328    91
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:        1.00 2.74  0.26  1.00 2.45  0.55  1.00 0.36  0.64  1.00 0.78  0.22
Final Sat.:   1600 4388   412  1600 3913   887  1600  579  1021  1600 1253   347
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.18 0.25  0.25  0.06 0.25  0.25  0.13 0.38  0.38  0.10 0.26  0.26
Crit Moves:   ****                   ****             ****      ****
******************************************************************************
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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                        Weekday Morning Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
     ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):          0.647
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100              Level Of Service:                  B
********************************************************************************
Street Name:             Nogales Street                SR-60 Freeway WB Ramps
Approach:        North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted         Permitted        Permitted
Rights:            Ignore           Ignore           Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  3  0  1    0  0  3  0  1    0  0  0  0  0    0  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  1169   281    0   848   223    0     0     0  290     0   621
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  1169   281    0   848   223    0     0     0  290     0   621
User Adj:    1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.97 0.97  0.00 0.97 0.97  0.00 0.97 0.97  0.97 0.97 0.97  0.97
PHF Volume:    0  1211     0    0   879     0    0     0     0  301     0   644
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   0  1211     0    0   879     0    0     0     0  301     0   644
PCE Adj:     1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   0  1211     0    0   879     0    0     0     0  301     0   644
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600  1600
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 3.00  1.00 0.00 3.00  1.00 0.00 0.00  0.00 0.64 0.00  1.36
Final Sat.:    0  4800  1600    0  4800  1600    0     0     0 1019     0  2181
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.25  0.00 0.00 0.18  0.00 0.00 0.00  0.00 0.19 0.00  0.30
Crit Moves:       ****       ****                                            ****
********************************************************************************
```

Rowland Heights Plaza
Existing
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16

Cycle (sec):	100	Critical Vol./Cap.(X):	0.630
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Nogales Street						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 3 0 1			0 0 3 0 1			0 0 0 0 0			0 0 1! 0 1		
Volume Module:												
Base Vol:	0	1019	216	0	1226	454	0	0	0	383	0	262
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1019	216	0	1226	454	0	0	0	383	0	262
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.00	0.93	0.93	0.00	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	1092	0	0	1314	0	0	0	0	411	0	281
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1092	0	0	1314	0	0	0	0	411	0	281
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1092	0	0	1314	0	0	0	0	411	0	281
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	4800	1600	0	4800	1600	0	0	0	1600	0	1600
Capacity Analysis Module:												
Vol/Sat:	0.00	0.23	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.26	0.00	0.18
Crit Moves:	****				****					****		

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------------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                           Saturday Peak Hour
------------------------------------------------------------------------------

                     Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):         0.631
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100               Level Of Service:                  B
********************************************************************************
Street Name:              Nogales Street              SR-60 Freeway WB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted         Permitted         Permitted         Permitted
Rights:           Ignore            Ignore           Include           Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Lanes:         0  0  3  0  1    0  0  3  0  1    0  0  0  0  0    0  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  991   364      0 1125   401      0    0     0    435    0   418
Growth Adj:  1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00
Initial Bse:    0  991   364      0 1125   401      0    0     0    435    0   418
User Adj:    1.00 1.00  0.00   1.00 1.00  0.00   1.00 1.00  1.00   1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.00   0.95 0.95  0.00   0.95 0.95  0.95   0.95 0.95  0.95
PHF Volume:     0 1039     0      0 1179     0      0    0     0    456    0   438
Reduct Vol:     0    0     0      0    0     0      0    0     0      0    0     0
Reduced Vol:    0 1039     0      0 1179     0      0    0     0    456    0   438
PCE Adj:     1.00 1.00  0.00   1.00 1.00  0.00   1.00 1.00  1.00   1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00   1.00 1.00  0.00   1.00 1.00  1.00   1.00 1.00  1.00
FinalVolume:    0 1039     0      0 1179     0      0    0     0    456    0   438
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600   1600 1600  1600   1600 1600  1600   1600 1600  1600
Adjustment:  1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00   1.00 1.00  1.00
Lanes:       0.00 3.00  1.00   0.00 3.00  1.00   0.00 0.00  0.00   1.00 0.00  1.00
Final Sat.:     0 4800  1600      0 4800  1600      0    0     0   1600    0  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.22  0.00   0.00 0.25  0.00   0.00 0.00  0.00   0.28 0.00  0.27
Crit Moves:  ****                   ****                           ****
********************************************************************************
```

Rowland Heights Plaza
Existing
Weekday Morning Peak Hour

```
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*******************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
*******************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):          0.549
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:       100               Level Of Service:                   A
*******************************************************************************
Street Name:               Nogales Street              SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted         Permitted         Permitted         Permitted
Rights:           Ignore            Ignore           Include           Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Lanes:        0  0  3  0  1    0  0  3  0  1    1  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1049   387     0  926   212   401     0   243     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1049   387     0  926   212   401     0   243     0     0     0
User Adj:    1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.00  0.94 0.94  0.00  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:     0 1122     0     0  990     0   429     0   260     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:    0 1122     0     0  990     0   429     0   260     0     0     0
PCE Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 1122     0     0  990     0   429     0   260     0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 3.00  1.00  0.00 3.00  1.00  1.24 0.01  0.75  0.00 0.00  0.00
Final Sat.:     0 4800  1600     0 4800  1600  1993     0  1207     0     0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.23  0.00  0.00 0.21  0.00  0.22 0.00  0.22  0.00 0.00  0.00
Crit Moves:       ****        ****              ****
*******************************************************************************
```

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-----------------------------------------------------------------------------
                         Rowland Heights Plaza
                               Existing
                       Weekday Evening Peak Hour
-----------------------------------------------------------------------------

                  Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*****************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
*****************************************************************************
Cycle (sec):           100             Critical Vol./Cap.(X):         0.684
Loss Time (sec):        10 (Y+R=0.0 sec) Average Delay (sec/veh):    xxxxxx
Optimal Cycle:         100             Level Of Service:                  B
*****************************************************************************
Street Name:              Nogales Street              SR-60 Freeway EB Ramps
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Ignore           Ignore          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        0  0  3  0  1   0  0  3  0  1   1  0  1! 0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  840   288     0 1322   287   397    0   420     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  840   288     0 1322   287   397    0   420     0    0     0
User Adj:    1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.00  0.92 0.92  0.00  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    0  912     0     0 1435     0   431    0   456     0    0     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0  912     0     0 1435     0   431    0   456     0    0     0
PCE Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   0  912     0     0 1435     0   431    0   456     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 3.00  1.00  0.00 3.00  1.00  1.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:    0 4800  1600     0 4800  1600  1600    0  1600     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.19  0.00  0.00 0.30  0.00  0.27 0.00  0.29  0.00 0.00  0.00
Crit Moves:  ****                  ****                  ****
*****************************************************************************
```

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-------------------------------------------------------------------------------
                             Rowland Heights Plaza
                                   Existing
                              Saturday Peak Hour
-------------------------------------------------------------------------------

                        Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*******************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
*******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):          0.596
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100               Level Of Service:                   A
*******************************************************************************
Street Name:                Nogales Street            SR-60 Freeway EB Ramps
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted         Permitted         Permitted         Permitted
Rights:           Ignore            Ignore           Include           Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  3  0  1    0  0  3  0  1    1  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0   947   423    0  1160   370  415     0   352    0     0     0
Growth Adj: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   0   947   423    0  1160   370  415     0   352    0     0     0
User Adj:   1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:    0.97  0.97  0.00 0.97  0.97  0.00 0.97  0.97  0.97 0.97  0.97  0.97
PHF Volume:    0   976     0    0  1196     0  428     0   363    0     0     0
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   0   976     0    0  1196     0  428     0   363    0     0     0
PCE Adj:    1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:    1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:   0   976     0    0  1196     0  428     0   363    0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:      0.00  3.00  1.00 0.00  3.00  1.00 1.08  0.00  0.92 0.00  0.00  0.00
Final Sat.:    0  4800  1600    0  4800  1600 1731     0  1469    0     0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00  0.20  0.00 0.00  0.25  0.00 0.25  0.00  0.25 0.00  0.00  0.00
Crit Moves: ****                     ****     ****
*******************************************************************************
```

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--------------------------------------------------------------------------------
                           Rowland Heights Plaza
                                 Existing
                         Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                     Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #18 Nogales Street (NS) at Colima Road (EW)
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.810
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100              Level Of Service:                  D
********************************************************************************
Street Name:              Nogales Street                    Colima Road
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include            Ovl            Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        2  0  2  0  1   2  0  2  0  1   2  0  2  1  0   2  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     313  741   137   248  626   244   356  576   202   180  668   333
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  313  741   137   248  626   244   356  576   202   180  668   333
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:   342  810   150   271  684   267   389  630   221   197  730   364
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  342  810   150   271  684   267   389  630   221   197  730   364
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  342  810   150   271  684   267   389  630   221   197  730   364
OvlAdjVol:                                 51
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  0.90 1.00  1.00  0.90 1.00  1.00  0.90 1.00  1.00  0.90 1.00  1.00
Lanes:       2.00 2.00  1.00  2.00 2.00  1.00  2.00 2.22  0.78  2.00 2.00  1.00
Final Sat.:  2880 3200  1600  2880 3200  1600  2880 3554  1246  2880 3203  1597
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.25  0.09  0.09 0.21  0.17  0.14 0.18  0.18  0.07 0.23  0.23
OvlAdjV/S:                               0.03
Crit Moves:       ****        ****              ****                   ****
********************************************************************************
```

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-----------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                        Weekday Evening Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*****************************************************************************
Intersection #18 Nogales Street (NS) at Colima Road (EW)
*****************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.720
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100              Level Of Service:                  C
*****************************************************************************
Street Name:               Nogales Street                    Colima Road
Approach:        North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected         Protected        Protected
Rights:          Include            Ovl             Include          Include
Min. Green:    0     0     0   0     0     0   0     0     0   0     0     0
Lanes:         2  0  2  0  1   2  0  2  0  1   2  0  2  1  0   2  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      231   531   163   440   769   386   335   889   197   186   609   224
Growth Adj:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   231   531   163   440   769   386   335   889   197   186   609   224
User Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:      0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98
PHF Volume:    235   540   166   448   782   393   341   904   200   189   620   228
Reduct Vol:      0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   235   540   166   448   782   393   341   904   200   189   620   228
PCE Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:   235   540   166   448   782   393   341   904   200   189   620   228
OvlAdjVol:                                   203
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:   0.90  1.00  1.00  0.90  1.00  1.00  0.90  1.00  1.00  0.90  1.00  1.00
Lanes:        2.00  2.00  1.00  2.00  2.00  1.00  2.00  2.46  0.54  2.00  2.19  0.81
Final Sat.:   2880  3200  1600  2880  3200  1600  2880  3929   871  2880  3509  1291
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.08  0.17  0.10  0.16  0.24  0.25  0.12  0.23  0.23  0.07  0.18  0.18
OvlAdjV/S:                                   0.13
Crit Moves:         ****  ****                           ****        ****
*****************************************************************************
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---------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                           Saturday Peak Hour
---------------------------------------------------------------------------
                     Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
***************************************************************************
Intersection #18 Nogales Street (NS) at Colima Road (EW)
***************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):        0.825
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       100              Level Of Service:                 D
***************************************************************************
Street Name:              Nogales Street                  Colima Road
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include           Ovl            Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       2  0  2  0  1   2  0  2  0  1   2  0  2  1  0   2  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      269  533   118   376  527   512   461  733   183   150  769   283
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   269  533   118   376  527   512   461  733   183   150  769   283
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:    288  571   126   403  565   549   494  786   196   161  824   303
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   288  571   126   403  565   549   494  786   196   161  824   303
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   288  571   126   403  565   549   494  786   196   161  824   303
OvlAdjVol:                                   274
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:   0.90 1.00  1.00  0.90 1.00  1.00  0.90 1.00  1.00  0.90 1.00  1.00
Lanes:        2.00 2.00  1.00  2.00 2.00  1.00  2.00 2.40  0.60  2.00 2.19  0.81
Final Sat.:   2880 3200  1600  2880 3200  1600  2880 3841   959  2880 3509  1291
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.10 0.18  0.08  0.14 0.18  0.34  0.17 0.20  0.20  0.06 0.23  0.23
OvlAdjV/S:                                  0.17
Crit Moves:        ****        ****              ****                   ****
***************************************************************************
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Existing Plus Project

Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1

Cycle (sec):	100	Critical Vol./Cap.(X):	0.672
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Fullerton Road						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0 2 0 1			1 0 2 1 0			1 0 2 0 1			1 0 1 1 0		
Volume Module:												
Base Vol:	476	875	186	35	373	147	163	203	186	50	350	40
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	476	875	186	35	373	147	163	203	186	50	350	40
Added Vol:	0	0	109	17	0	0	0	0	0	80	0	12
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	476	875	295	52	373	147	163	203	186	130	350	52
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	511	939	317	56	400	158	175	218	200	139	376	56
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	511	939	317	56	400	158	175	218	200	139	376	56
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	511	939	317	56	400	158	175	218	200	139	376	56
OvlAdjVol:			177						0			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	1.00	2.15	0.85	1.00	2.00	1.00	1.00	1.74	0.26
Final Sat.:	2880	3200	1600	1600	3443	1357	1600	3200	1600	1600	2786	414
Capacity Analysis Module:												
Vol/Sat:	0.18	0.29	0.20	0.03	0.12	0.12	0.11	0.07	0.12	0.09	0.13	0.13
OvlAdjV/S:			0.11						0.00			
Crit Moves:		****		****			****				****	

Rowland Heights Plaza
Existing Plus Project
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1

Cycle (sec):	100	Critical Vol./Cap.(X):	0.730
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Fullerton Road		Gale Avenue	
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Protected	Protected
Rights:	Ovl	Include	Ovl	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	2 0 2 0 1	1 0 2 1 0	1 0 2 0 1	1 0 1 1 0

Volume Module:	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Base Vol:	342	531	142	52	494	177	226	477	397	172	331	56
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	342	531	142	52	494	177	226	477	397	172	331	56
Added Vol:	0	0	148	23	0	0	0	0	0	133	0	21
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	342	531	290	75	494	177	226	477	397	305	331	77
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	360	560	306	79	521	187	238	503	418	321	349	81
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	360	560	306	79	521	187	238	503	418	321	349	81
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	360	560	306	79	521	187	238	503	418	321	349	81
OvlAdjVol:			0						218			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	1.00	2.21	0.79	1.00	2.00	1.00	1.00	1.62	0.38
Final Sat.:	2880	3200	1600	1600	3534	1266	1600	3200	1600	1600	2596	604
Capacity Analysis Module:												
Vol/Sat:	0.13	0.17	0.19	0.05	0.15	0.15	0.15	0.16	0.26	0.20	0.13	0.13
OvlAdjV/S:			0.00						0.14			
Crit Moves:	****				****			****		****		

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--------------------------------------------------------------------------------
                           Rowland Heights Plaza
                           Existing Plus Project
                            Saturday Peak Hour
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                    Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):          0.878
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100              Level Of Service:                   D
********************************************************************************
Street Name:           Fullerton Road                    Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|-----------------||-----------------||-----------------||-----------------|
Control:        Protected        Protected        Protected        Protected
Rights:            Ovl             Include           Ovl             Include
Min. Green:    0     0     0   0     0     0   0     0     0   0     0     0
Lanes:        2  0  2  0  1   1  0  2  1  0   1  0  2  0  1   1  0  1  1  0
------------|-----------------||-----------------||-----------------||-----------------|
Volume Module:
Base Vol:     592   376   271    46   414   320   235   415   507   176   334    45
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:  592   376   271    46   414   320   235   415   507   176   334    45
Added Vol:      0     0   187    29     0     0     0     0     0   174     0    27
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:  592   376   458    75   414   320   235   415   507   350   334    72
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97
PHF Volume:   611   388   473    77   427   330   243   428   523   361   345    74
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:  611   388   473    77   427   330   243   428   523   361   345    74
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:  611   388   473    77   427   330   243   428   523   361   345    74
OvlAdjVol:                111                                184
------------|-----------------||-----------------||-----------------||-----------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:  0.90  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       2.00  2.00  1.00  1.00  2.00  1.00  1.00  2.00  1.00  1.00  1.65  0.35
Final Sat.:  2880  3200  1600  1600  3200  1600  1600  3200  1600  1600  2633   567
------------|-----------------||-----------------||-----------------||-----------------|
Capacity Analysis Module:
Vol/Sat:     0.21  0.12  0.30  0.05  0.13  0.21  0.15  0.13  0.33  0.23  0.13  0.13
OvlAdjV/S:               0.07                                0.11
Crit Moves:  ****                          ****        ****        ****
********************************************************************************
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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                          Existing Plus Project
               Weekday Morning Peak Hour - With Improvements
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.672
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  B
********************************************************************************
Street Name:              Fullerton Road                   Gale Avenue
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:            Ovl            Include            Ovl            Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:         2  0  2  0  1   1  0  2  1  0   1  0  2  0  1   2  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      476  875   186    35  373   147   163  203   186    50  350    40
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   476  875   186    35  373   147   163  203   186    50  350    40
Added Vol:       0    0   109    17    0     0     0    0     0    80    0    12
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   476  875   295    52  373   147   163  203   186   130  350    52
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:    511  939   317    56  400   158   175  218   200   139  376    56
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   511  939   317    56  400   158   175  218   200   139  376    56
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   511  939   317    56  400   158   175  218   200   139  376    56
OvlAdjVol:                239                                  0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:   0.90 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  0.90 1.00  1.00
Lanes:        2.00 2.00  1.00  1.00 2.15  0.85  1.00 2.00  1.00  2.00 1.74  0.26
Final Sat.:   2880 3200  1600  1600 3443  1357  1600 3200  1600  2880 2786   414
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.18 0.29  0.20  0.03 0.12  0.12  0.11 0.07  0.12  0.05 0.13  0.13
OvlAdjV/S:               0.15                                0.00
Crit Moves:        ****        ****              ****                   ****
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--------------------------------------------------------------------------------
                              Rowland Heights Plaza
                              Existing Plus Project
                   Weekday Evening Peak Hour - With Improvements
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                         Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.656
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100                Level Of Service:                  B
********************************************************************************
Street Name:              Fullerton Road                    Gale Avenue
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:            Ovl             Include           Ovl             Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:          2  0  2  0  1   1  0  2  1  0   1  0  2  0  1   2  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      342  531  142    52  494  177   226  477  397   172  331   56
Growth Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   342  531  142    52  494  177   226  477  397   172  331   56
Added Vol:       0    0  148    23    0    0     0    0    0   133    0   21
PasserByVol:     0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:   342  531  290    75  494  177   226  477  397   305  331   77
User Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:      0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95
PHF Volume:    360  560  306    79  521  187   238  503  418   321  349   81
Reduct Vol:      0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   360  560  306    79  521  187   238  503  418   321  349   81
PCE Adj:      1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:      1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:   360  560  306    79  521  187   238  503  418   321  349   81
OvlAdjVol:                127                              218
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600
Adjustment:   0.90 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  0.90 1.00 1.00
Lanes:        2.00 2.00 1.00  1.00 2.21 0.79  1.00 2.00 1.00  2.00 1.62 0.38
Final Sat.:   2880 3200 1600  1600 3534 1266  1600 3200 1600  2880 2596  604
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.13 0.17 0.19  0.05 0.15 0.15  0.15 0.16 0.26  0.11 0.13 0.13
OvlAdjV/S:                0.08                              0.14
Crit Moves:   ****                 ****       ****                  ****
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Rowland Heights Plaza
Existing Plus Project
Saturday Peak Hour - With Improvements

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1

Cycle (sec):	100	Critical Vol./Cap.(X):	0.801
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	D

Street Name:		Fullerton Road						Gale Avenue				
Approach:		North Bound			South Bound			East Bound			West Bound	
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Ovl			Include			Ovl			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		2 0 2 0 1			1 0 2 1 0			1 0 2 0 1			2 0 1 1 0	
Volume Module:												
Base Vol:	592	376	271	46	414	320	235	415	507	176	334	45
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	592	376	271	46	414	320	235	415	507	176	334	45
Added Vol:	0	0	187	29	0	0	0	0	0	174	0	27
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	592	376	458	75	414	320	235	415	507	350	334	72
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	611	388	473	77	427	330	243	428	523	361	345	74
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	611	388	473	77	427	330	243	428	523	361	345	74
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	611	388	473	77	427	330	243	428	523	361	345	74
OvlAdjVol:			272						184			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00
Lanes:	2.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00	2.00	1.65	0.35
Final Sat.:	2880	3200	1600	1600	3200	1600	1600	3200	1600	2880	2633	567
Capacity Analysis Module:												
Vol/Sat:	0.21	0.12	0.30	0.05	0.13	0.21	0.15	0.13	0.33	0.13	0.13	0.13
OvlAdjV/S:			0.17						0.11			
Crit Moves:	****					****	****				****	

Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2

Cycle (sec):	100	Critical Vol./Cap.(X):	0.561
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Fullerton Road						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	3	0 1	0 0	3	0 0	0 0	0	0 0	1 0	1!	0 1
Volume Module:												
Base Vol:	0	1004	323	0	604	0	0	0	0	391	0	573
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1004	323	0	604	0	0	0	0	391	0	573
Added Vol:	0	109	0	0	80	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1113	323	0	684	0	0	0	0	391	0	573
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.00	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	0	1185	0	0	728	0	0	0	0	416	0	610
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1185	0	0	728	0	0	0	0	416	0	610
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1185	0	0	728	0	0	0	0	416	0	610
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	0.00	3.00	0.00	0.00	0.00	0.00	1.21	0.01	1.78
Final Sat.:	0	4800	1600	0	4800	0	0	0	0	1947	0	2853
Capacity Analysis Module:												
Vol/Sat:	0.00	0.25	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.21	0.00	0.21
Crit Moves:		****		****						****		

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--------------------------------------------------------------------------------
                            Rowland Heights Plaza
                            Existing Plus Project
                          Weekday Evening Peak Hour
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                      Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.499
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  A
********************************************************************************
Street Name:              Fullerton Road               SR-60 Freeway WB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:            Ignore          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         0  0  3  0  1   0  0  3  0  0   0  0  0  0  0   1  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  709   532    0 1049     0    0    0     0  368    0   334
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0  709   532    0 1049     0    0    0     0  368    0   334
Added Vol:      0  148     0    0  133     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0  857   532    0 1182     0    0    0     0  368    0   334
User Adj:    1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.98 0.98  0.00 0.98 0.98  0.98 0.98 0.98  0.98 0.98 0.98  0.98
PHF Volume:     0  872     0    0 1202     0    0    0     0  374    0   340
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0  872     0    0 1202     0    0    0     0  374    0   340
PCE Adj:     1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0  872     0    0 1202     0    0    0     0  374    0   340
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600  1600
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 3.00  1.00 0.00 3.00  0.00 0.00 0.00  0.00 1.57 xxxx  1.43
Final Sat.:     0 4800  1600    0 4800     0    0    0     0 2516    0  2284
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.18  0.00 0.00 0.25  0.00 0.00 0.00  0.00 0.15 0.00  0.15
Crit Moves:  ****                 ****                        ****
********************************************************************************
```

```
--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                          Existing Plus Project
                           Saturday Peak Hour
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.604
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  B
********************************************************************************
Street Name:              Fullerton Road              SR-60 Freeway WB Ramps
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Ignore          Include          Include          Include
Min. Green:   0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        0  0  3  0  1   0  0  3  0  0   0  0  0  0  0   1  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  744   579     0 1097     0     0     0     0   549     0   494
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  744   579     0 1097     0     0     0     0   549     0   494
Added Vol:     0  187     0     0  174     0     0     0     0     0     0     0
PasserByVol:   0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:   0  931   579     0 1271     0     0     0     0   549     0   494
User Adj:    1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.00  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    0  974     0     0 1329     0     0     0     0   574     0   517
Reduct Vol:    0    0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:   0  974     0     0 1329     0     0     0     0   574     0   517
PCE Adj:     1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   0  974     0     0 1329     0     0     0     0   574     0   517
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 3.00  1.00  0.00 3.00  0.00  0.00 0.00  0.00  1.58 xxxx  1.42
Final Sat.:     0 4800  1600     0 4800     0     0     0     0  2527    0  2273
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.20  0.00  0.00 0.28  0.00  0.00 0.00  0.00  0.23 0.00  0.23
Crit Moves:  ****                   ****                         ****
********************************************************************************
```

```
--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                          Existing Plus Project
                        Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                     Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.698
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  B
********************************************************************************
Street Name:              Fullerton Road               SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Protected       Split Phase      Split Phase
Rights:           Include          Ignore           Ignore           Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        0  0  1  1  0   1  0  2  0  1   1  1  0  0  1   2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1278   15    12  684  217   410   10  552     5    0   18
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    0 1278   15    12  684  217   410   10  552     5    0   18
Added Vol:      0   50    0     0   37    0    59    0    0     0    0    0
PasserByVol:    0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:    0 1328   15    12  721  217   469   10  552     5    0   18
User Adj:    1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 0.00  1.00 1.00 1.00
PHF Adj:     0.98 0.98 0.98  0.98 0.98 0.00  0.98 0.98 0.00  0.98 0.98 0.98
PHF Volume:     0 1350   15    12  733    0   477   10    0     5    0   18
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    0 1350   15    12  733    0   477   10    0     5    0   18
PCE Adj:     1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 0.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 0.00  1.00 1.00 1.00
FinalVolume:    0 1350   15    12  733    0   477   10    0     5    0   18
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  0.90 1.00 1.00
Lanes:       0.00 1.98 0.02  1.00 2.00 1.00  1.96 0.04 1.00  2.00 0.00 1.00
Final Sat.:     0 3164   36  1600 3200 1600  3133   67 1600  2880    0 1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.43 0.43  0.01 0.23 0.00  0.15 0.15 0.00  0.00 0.00 0.01
Crit Moves:       ****       ****                  ****                   ****
********************************************************************************
```

```
---------------------------------------------------------------------------
                           Rowland Heights Plaza
                           Existing Plus Project
                         Weekday Evening Peak Hour
---------------------------------------------------------------------------

                     Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
***************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
***************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):        0.705
Loss Time (sec):       10 (Y+R=0.0 sec)   Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100                 Level Of Service:                 C
***************************************************************************
Street Name:               Fullerton Road               SR-60 Freeway EB Ramps
Approach:        North Bound      South Bound       East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:          Permitted        Protected       Split Phase       Split Phase
Rights:            Include           Ignore           Ignore           Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:          0  0  1  1  0   1  0  2  0  1    1  1  0  0  1    2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:         0 1259    36    44  834   265   201   17   538    31    0    57
Growth Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:      0 1259    36    44  834   265   201   17   538    31    0    57
Added Vol:        0   70     0     0   62     0    78    0     0     0    0     0
PasserByVol:      0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:      0 1329    36    44  896   265   279   17   538    31    0    57
User Adj:      1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
PHF Adj:       0.96 0.96  0.96  0.96 0.96  0.00  0.96 0.96  0.00  0.96 0.96  0.96
PHF Volume:       0 1381    37    46  931     0   290   18     0    32    0    59
Reduct Vol:       0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:      0 1381    37    46  931     0   290   18     0    32    0    59
PCE Adj:       1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
MLF Adj:       1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
FinalVolume:      0 1381    37    46  931     0   290   18     0    32    0    59
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:      1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  0.90 1.00  1.00
Lanes:         0.00 1.95  0.05  1.00 2.00  1.00  1.89 0.11  1.00  2.00 0.00  1.00
Final Sat.:       0 3116    84  1600 3200  1600  3016  184  1600  2880    0  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:       0.00 0.44  0.44  0.03 0.29  0.00  0.10 0.10  0.00  0.01 0.00  0.04
Crit Moves:         ****        ****             ****                         ****
***************************************************************************
```

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-------------------------------------------------------------------------------
                          Rowland Heights Plaza
                          Existing Plus Project
                           Saturday Peak Hour
-------------------------------------------------------------------------------

                    Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*******************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
*******************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):         0.907
Loss Time (sec):       10 (Y+R=0.0 sec)   Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100                 Level Of Service:                  E
*******************************************************************************
Street Name:              Fullerton Road             SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Protected       Split Phase      Split Phase
Rights:          Include          Ignore           Ignore           Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        0  0  1  1  0   1  0  2  0  1   1  1  0  0  1   2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1413   81   121  917  373   255   66  567    60    0  131
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    0 1413   81   121  917  373   255   66  567    60    0  131
Added Vol:      0   88    0     0   82    0    99    0    0     0    0    0
PasserByVol:    0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:    0 1501   81   121  999  373   354   66  567    60    0  131
User Adj:    1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 0.00  1.00 1.00 1.00
PHF Adj:     0.97 0.97 0.97  0.97 0.97 0.00  0.97 0.97 0.00  0.97 0.97 0.97
PHF Volume:     0 1547   84   125 1030    0   365   68    0    62    0  135
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    0 1547   84   125 1030    0   365   68    0    62    0  135
PCE Adj:     1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 0.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 0.00  1.00 1.00 1.00
FinalVolume:    0 1547   84   125 1030    0   365   68    0    62    0  135
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  0.90 1.00 1.00
Lanes:       0.00 1.90 0.10  1.00 2.00 1.00  1.69 0.31 1.00  2.00 0.00 1.00
Final Sat.:     0 3036  164  1600 3200 1600  2697  503 1600  2880    0 1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.51 0.51  0.08 0.32 0.00  0.14 0.14 0.00  0.02 0.00 0.08
Crit Moves:       ****       ****            ****                         ****
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                         Rowland Heights Plaza
                         Existing Plus Project
            Weekday Morning Peak Hour - With Improvements
--------------------------------------------------------------------------------

                   Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.556
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100              Level Of Service:                  A
********************************************************************************
Street Name:               Fullerton Road                SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Protected        Split Phase       Split Phase
Rights:          Include           Ignore            Ignore           Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  2  1  0   1  0  2  0  1   1  1  0  0  1   2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1278    15   12  684   217  410   10   552    5    0    18
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0 1278    15   12  684   217  410   10   552    5    0    18
Added Vol:     0   50     0    0   37     0   59    0     0    0    0     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   0 1328    15   12  721   217  469   10   552    5    0    18
User Adj:    1.00 1.00  1.00 1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00
PHF Adj:     0.98 0.98  0.98 0.98 0.98  0.00 0.98 0.98  0.00 0.98 0.98  0.98
PHF Volume:    0 1350    15   12  733     0  477   10     0    5    0    18
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0 1350    15   12  733     0  477   10     0    5    0    18
PCE Adj:     1.00 1.00  1.00 1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00
FinalVolume:   0 1350    15   12  733     0  477   10     0    5    0    18
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600  1600
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 0.90 1.00  1.00
Lanes:       0.00 2.97  0.03 1.00 2.00  1.00 1.96 0.04  1.00 2.00 0.00  1.00
Final Sat.:    0 4746    54 1600 3200  1600 3133   67  1600 2880    0  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.28  0.28 0.01 0.23  0.00 0.15 0.15  0.00 0.00 0.00  0.01
Crit Moves:       ****       ****                    ****                   ****
********************************************************************************
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------------------------------------------------------------------------------
                          Rowland Heights Plaza
                          Existing Plus Project
               Weekday Evening Peak Hour - With Improvements
------------------------------------------------------------------------------
                     Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
******************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
******************************************************************************
Cycle (sec):        100               Critical Vol./Cap.(X):         0.557
Loss Time (sec):     10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:      100               Level Of Service:                  A
******************************************************************************
Street Name:              Fullerton Road               SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Protected       Split Phase      Split Phase
Rights:           Include          Ignore           Ignore           Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  2  1  0   1  0  2  0  1   1  1  0  0  1   2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1259    36    44  834   265   201   17   538    31    0    57
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1259    36    44  834   265   201   17   538    31    0    57
Added Vol:      0   70     0     0   62     0    78    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 1329    36    44  896   265   279   17   538    31    0    57
User Adj:    1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.00  0.96 0.96  0.00  0.96 0.96  0.96
PHF Volume:     0 1381    37    46  931     0   290   18     0    32    0    59
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1381    37    46  931     0   290   18     0    32    0    59
PCE Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
FinalVolume:    0 1381    37    46  931     0   290   18     0    32    0    59
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  0.90 1.00  1.00
Lanes:       0.00 2.92  0.08  1.00 2.00  1.00  1.89 0.11  1.00  2.00 0.00  1.00
Final Sat.:     0 4673   127  1600 3200  1600  3016  184  1600  2880    0  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.30  0.30  0.03 0.29  0.00  0.10 0.10  0.00  0.01 0.00  0.04
Crit Moves:       ****        ****             ****                         ****
******************************************************************************
```

Rowland Heights Plaza
Existing Plus Project
Saturday Peak Hour - With Improvements

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3

Cycle (sec):	100	Critical Vol./Cap.(X):	0.737
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Fullerton Road						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Ignore			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	2	1 0	1 0	2	0 1	1 1	0	0 1	2 0	0	0 1
Volume Module:												
Base Vol:	0	1413	81	121	917	373	255	66	567	60	0	131
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1413	81	121	917	373	255	66	567	60	0	131
Added Vol:	0	88	0	0	82	0	99	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1501	81	121	999	373	354	66	567	60	0	131
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.00	0.97	0.97	0.00	0.97	0.97	0.97
PHF Volume:	0	1547	84	125	1030	0	365	68	0	62	0	135
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1547	84	125	1030	0	365	68	0	62	0	135
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	0	1547	84	125	1030	0	365	68	0	62	0	135
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00
Lanes:	0.00	2.85	0.15	1.00	2.00	1.00	1.69	0.31	1.00	2.00	0.00	1.00
Final Sat.:	0	4554	246	1600	3200	1600	2697	503	1600	2880	0	1600
Capacity Analysis Module:												
Vol/Sat:	0.00	0.34	0.34	0.08	0.32	0.00	0.14	0.14	0.00	0.02	0.00	0.08
Crit Moves:		****		****			****					****

Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #4 Fullerton Road (NS) at Colima Road (EW)

Cycle (sec): 100 Critical Vol./Cap.(X): 0.791
Loss Time (sec): 10 (Y+R=0.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 100 Level Of Service: C

Street Name:	Fullerton Road						Colima Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	1	1 0	2 0	1	1 0	2 0	2	1 0	2 0	2	1 0
Volume Module:												
Base Vol:	291	771	68	198	841	151	95	368	144	179	739	264
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	291	771	68	198	841	151	95	368	144	179	739	264
Added Vol:	0	33	0	0	24	12	17	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	291	804	68	198	865	163	112	368	144	179	739	264
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	300	829	70	204	892	168	115	379	148	185	762	272
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	300	829	70	204	892	168	115	379	148	185	762	272
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	300	829	70	204	892	168	115	379	148	185	762	272
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00
Lanes:	2.00	1.84	0.16	2.00	1.68	0.32	2.00	2.16	0.84	2.00	2.21	0.79
Final Sat.:	2880	2950	250	2880	2693	507	2880	3450	1350	2880	3537	1263
Capacity Analysis Module:												
Vol/Sat:	0.10	0.28	0.28	0.07	0.33	0.33	0.04	0.11	0.11	0.06	0.22	0.22
Crit Moves:	****				****		****				****	

```
---------------------------------------------------------------------------
                       Rowland Heights Plaza
                       Existing Plus Project
                     Weekday Evening Peak Hour
---------------------------------------------------------------------------
                  Level Of Service Computation Report
     ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
***************************************************************************
Intersection #4 Fullerton Road (NS) at Colima Road (EW)
***************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):        0.840
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):    xxxxxx
Optimal Cycle:        100              Level Of Service:                 D
***************************************************************************
Street Name:            Fullerton Road                     Colima Road
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         2  0  1  1  0   2  0  1  1  0   2  0  2  1  0   2  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      267  706    85   400  755   151   172 1029   144   209  720   213
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   267  706    85   400  755   151   172 1029   144   209  720   213
Added Vol:       0   47     0     0   41    21    23    0     0     0    0     0
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   267  753    85   400  796   172   195 1029   144   209  720   213
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:    275  776    88   412  821   177   201 1061   148   215  742   220
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   275  776    88   412  821   177   201 1061   148   215  742   220
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   275  776    88   412  821   177   201 1061   148   215  742   220
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:   0.90 1.00  1.00  0.90 1.00  1.00  0.90 1.00  1.00  0.90 1.00  1.00
Lanes:        2.00 1.80  0.20  2.00 1.64  0.36  2.00 2.63  0.37  2.00 2.32  0.68
Final Sat.:   2880 2875   325  2880 2631   569  2880 4211   589  2880 3704  1096
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.10 0.27  0.27  0.14 0.31  0.31  0.07 0.25  0.25  0.07 0.20  0.20
Crit Moves:        ****        ****                   ****        ****
***************************************************************************
```

Rowland Heights Plaza
Existing Plus Project
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #4 Fullerton Road (NS) at Colima Road (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.878
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	D

Street Name:	Fullerton Road						Colima Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	1 1	0	2 0	1 1	0	2 0	2 1	0	2 0	2 1	0
Volume Module:												
Base Vol:	280	532	101	397	610	263	263	951	162	220	972	312
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	280	532	101	397	610	263	263	951	162	220	972	312
Added Vol:	0	59	0	0	55	27	29	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	280	591	101	397	665	290	292	951	162	220	972	312
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	285	601	103	404	677	295	297	967	165	224	989	317
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	285	601	103	404	677	295	297	967	165	224	989	317
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	285	601	103	404	677	295	297	967	165	224	989	317
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00
Lanes:	2.00	1.71	0.29	2.00	1.39	0.61	2.00	2.56	0.44	2.00	2.27	0.73
Final Sat.:	2880	2733	467	2880	2228	972	2880	4101	699	2880	3634	1166
Capacity Analysis Module:												
Vol/Sat:	0.10	0.22	0.22	0.14	0.30	0.30	0.10	0.24	0.24	0.08	0.27	0.27
Crit Moves:	****				****		****				****	

Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #5 Coiner Court (NS) at Gale Avenue (EW) - #5

Cycle (sec):	100	Critical Vol./Cap.(X):	0.368
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Coiner Court						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0	0 0	1 0	0	0 1	1 0	2	0 0	0 0	1	1 0
Volume Module:												
Base Vol:	0	0	0	12	0	4	46	158	0	0	500	64
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	12	0	4	46	158	0	0	500	64
Added Vol:	0	0	0	0	0	0	0	126	0	0	92	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	12	0	4	46	284	0	0	592	64
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	0	0	0	13	0	4	51	316	0	0	659	71
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	13	0	4	51	316	0	0	659	71
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	13	0	4	51	316	0	0	659	71
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	1.80	0.20
Final Sat.:	0	0	0	1600	0	1600	1600	3200	0	0	2888	312
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.01	0.00	0.00	0.03	0.10	0.00	0.00	0.23	0.23
Crit Moves:				****			****				****	

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--------------------------------------------------------------------------------
                           Rowland Heights Plaza
                           Existing Plus Project
                         Weekday Evening Peak Hour
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                   Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #5 Coiner Court (NS) at Gale Avenue (EW) - #5
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.488
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100              Level Of Service:                  A
********************************************************************************
Street Name:              Coiner Court                    Gale Avenue
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  0  0  0  0    1  0  0  0  1    1  0  2  0  0    0  0  1  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      0    0    0   117    0   47    13  693    0     0  390   22
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   0    0    0   117    0   47    13  693    0     0  390   22
Added Vol:     0    0    0     0    0    0     0  171    0     0  154    0
PasserByVol:   0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:   0    0    0   117    0   47    13  864    0     0  544   22
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.89 0.89 0.89  0.89 0.89 0.89  0.89 0.89 0.89  0.89 0.89 0.89
PHF Volume:    0    0    0   132    0   53    15  976    0     0  615   25
Reduct Vol:    0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   0    0    0   132    0   53    15  976    0     0  615   25
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:   0    0    0   132    0   53    15  976    0     0  615   25
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1600 1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       0.00 0.00 0.00  1.00 0.00 1.00  1.00 2.00 0.00  0.00 1.92 0.08
Final Sat.:    0    0    0  1600    0 1600  1600 3200    0     0 3076  124
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.00  0.08 0.00 0.03  0.01 0.31 0.00  0.00 0.20 0.20
Crit Moves:                  ****                   ****         ****
********************************************************************************
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------------------------------------------------------------------------------
                         Rowland Heights Plaza
                         Existing Plus Project
                          Saturday Peak Hour
------------------------------------------------------------------------------

                  Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
******************************************************************************
Intersection #5 Coiner Court (NS) at Gale Avenue (EW) - #5
******************************************************************************
Cycle (sec):        100            Critical Vol./Cap.(X):         0.401
Loss Time (sec):     10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:      100            Level Of Service:                 A
******************************************************************************
Street Name:            Coiner Court                      Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  0  0  0    1  0  0  0  1    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0     0     0   17     0    18   17   655     0    0   482    14
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:    0     0     0   17     0    18   17   655     0    0   482    14
Added Vol:      0     0     0    0     0     0    0   216     0    0   202     0
PasserByVol:    0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:    0     0     0   17     0    18   17   871     0    0   684    14
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94
PHF Volume:     0     0     0   18     0    19   18   927     0    0   728    15
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:    0     0     0   18     0    19   18   927     0    0   728    15
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:    0     0     0   18     0    19   18   927     0    0   728    15
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       0.00  0.00  0.00 1.00  0.00  1.00 1.00  2.00  0.00 0.00  1.96  0.04
Final Sat.:     0     0     0 1600     0  1600 1600  3200     0    0  3136    64
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00 0.01  0.00  0.01 0.01  0.29  0.00 0.00  0.23  0.23
Crit Moves:                   ****                    ****      ****
******************************************************************************
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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                          Existing Plus Project
               Weekday Morning Peak Hour - With Improvements
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #6 Project West Access (NS) at Gale Avenue (EW) - #6
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):          0.380
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:       100              Level Of Service:                   A
********************************************************************************
Street Name:         Project West Access                  Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  0  0  0  0   0  0  1! 0  0   1  0  2  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0    0     0    0    0     0  163    0     0  598    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    0    0    0     0    0    0     0  163    0     0  598    0
Added Vol:      0    0    0    27    0   13    17  114    0     0   84   55
PasserByVol:    0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:    0    0    0    27    0   13    17  277    0     0  682   55
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95
PHF Volume:     0    0    0    28    0   14    18  292    0     0  718   58
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    0    0    0    28    0   14    18  292    0     0  718   58
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:    0    0    0    28    0   14    18  292    0     0  718   58
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       0.00 0.00 0.00  0.67 0.00 0.33  1.00 2.00 0.00  0.00 1.85 0.15
Final Sat.:     0    0    0  1080    0  520  1600 3200    0     0 2961  239
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.00  0.02 0.00 0.03  0.01 0.09 0.00  0.00 0.24 0.24
Crit Moves:                             ****  ****                  ****
********************************************************************************
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--------------------------------------------------------------------------------
                            Rowland Heights Plaza
                            Existing Plus Project
               Weekday Evening Peak Hour - With Improvements
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #6 Project West Access (NS) at Gale Avenue (EW) - #6
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.454
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100                Level Of Service:                  A
********************************************************************************
Street Name:          Project West Access                Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  0  0  0    0  0  1! 0  0    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0     0     0    0     0     0    0   806     0    0   415     0
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   0     0     0    0     0     0    0   806     0    0   415     0
Added Vol:     0     0     0   34     0    22   25   159     0    0   142    58
PasserByVol:   0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:   0     0     0   34     0    22   25   965     0    0   557    58
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95
PHF Volume:    0     0     0   36     0    23   26  1016     0    0   586    61
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   0     0     0   36     0    23   26  1016     0    0   586    61
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:   0     0     0   36     0    23   26  1016     0    0   586    61
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       0.00  0.00  0.00 0.61  0.00  0.39 1.00  2.00  0.00 0.00  1.81  0.19
Final Sat.:    0     0     0  971     0   629 1600  3200     0    0  2898   302
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00 0.02  0.00  0.04 0.02  0.32  0.00 0.00  0.20  0.20
Crit Moves:                               ****       ****       ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                         Rowland Heights Plaza
                         Existing Plus Project
                 Saturday Peak Hour - With Improvements
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #6 Project West Access (NS) at Gale Avenue (EW) - #6
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.433
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100                Level Of Service:                 A
********************************************************************************
Street Name:       Project West Access                  Gale Avenue
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0     0     0    0     0     0    0   672     0    0   517     0
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   0     0     0    0     0     0    0   672     0    0   517     0
Added Vol:     0     0     0   41     0    29   32   201     0    0   187    74
PasserByVol:   0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:   0     0     0   41     0    29   32   873     0    0   704    74
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95
PHF Volume:    0     0     0   43     0    31   34   919     0    0   741    78
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   0     0     0   43     0    31   34   919     0    0   741    78
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:   0     0     0   43     0    31   34   919     0    0   741    78
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       0.00  0.00  0.00 0.58  0.01  0.41 1.00  2.00  0.00 0.00  1.81  0.19
Final Sat.:    0     0     0  937     0   663 1600  3200     0    0  2896   304
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00 0.03  0.00  0.05 0.02  0.29  0.00 0.00  0.26  0.26
Crit Moves:                               ****       ****       ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                         Rowland Heights Plaza
                         Existing Plus Project
                       Weekday Morning Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.452
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100              Level Of Service:                  A
********************************************************************************
Street Name:       Project Central Access                Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  1! 0  0   0  0  1! 0  0   0  1  0  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       3     0     8    0     0     0    0   159     4    4   595     0
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:    3     0     8    0     0     0    0   159     4    4   595     0
Added Vol:      0     0     0   33     0    59   55    86     0    0    79    71
PasserByVol:    0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:    3     0     8   33     0    59   55   245     4    4   674    71
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93
PHF Volume:     3     0     9   36     0    64   59   264     4    4   726    76
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:    3     0     9   36     0    64   59   264     4    4   726    76
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:    3     0     9   36     0    64   59   264     4    4   726    76
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       0.27  0.00  0.73 0.36  0.00  0.64 0.36  1.61  0.03 1.00  1.81  0.19
Final Sat.:   436     0  1164  574     0  1026  579  2579    42 1600  2895   305
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.01 0.02  0.00  0.06 0.04  0.10  0.10 0.00  0.25  0.25
Crit Moves:  ****                         **** ****                   ****
********************************************************************************
```

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-------------------------------------------------------------------------------
                          Rowland Heights Plaza
                         Existing Plus Project
                       Weekday Evening Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*******************************************************************************
Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7
*******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.532
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  A
*******************************************************************************
Street Name:      Project Central Access                Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  1  0  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       7    0     6    0    0     0    0  800     1    3  412     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    7    0     6    0    0     0    0  800     1    3  412     0
Added Vol:      0    0     0   48    0    87   58  136     0    0  112    92
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    7    0     6   48    0    87   58  936     1    3  524    92
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93
PHF Volume:     8    0     6   52    0    94   62 1008     1    3  564    99
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    8    0     6   52    0    94   62 1008     1    3  564    99
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    8    0     6   52    0    94   62 1008     1    3  564    99
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600  1600
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.54 0.00  0.46 0.36 0.00  0.64 0.11 1.88  0.01 1.00 1.70  0.30
Final Sat.:   862    0   738  569    0  1031  187 3010     3 1600 2722   478
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.01 0.03 0.00  0.09 0.04 0.33  0.33 0.00 0.21  0.21
Crit Moves:  ****                       ****      ****           ****
*******************************************************************************
```

```
                          Rowland Heights Plaza
                          Existing Plus Project
                           Saturday Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):          0.519
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100                Level Of Service:                   A
********************************************************************************
Street Name:       Project Central Access                   Gale Avenue
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  1! 0  0   0  0  1! 0  0   0  1  0  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       4     0     5    0     0     0    0   665     3    9   508     0
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:    4     0     5    0     0     0    0   665     3    9   508     0
Added Vol:      0     0     0   60     0   110   74   168     0    0   150   116
PasserByVol:    0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:    4     0     5   60     0   110   74   833     3    9   658   116
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95
PHF Volume:     4     0     5   63     0   116   78   876     3    9   692   122
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:    4     0     5   63     0   116   78   876     3    9   692   122
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:    4     0     5   63     0   116   78   876     3    9   692   122
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       0.44  0.00  0.56 0.35  0.00  0.65 0.16  1.83  0.01 1.00  1.70  0.30
Final Sat.:   711     0   889  565     0  1035  260  2929    11 1600  2720   480
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.01 0.04  0.00  0.11 0.05  0.30  0.30 0.01  0.25  0.25
Crit Moves:  ****                         ****        ****       ****
********************************************************************************
```

Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour - With Improvements

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7

Cycle (sec): 100 Critical Vol./Cap.(X): 0.452
Loss Time (sec): 10 (Y+R=0.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 100 Level Of Service: A

Street Name:	Project Central Access						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	1!	0 0	0 0	1!	0 0	1 0	1	1 0	1 0	1	1 0
Volume Module:												
Base Vol:	3	0	8	0	0	0	0	159	4	4	595	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	3	0	8	0	0	0	0	159	4	4	595	0
Added Vol:	0	0	0	33	0	59	55	86	0	0	79	71
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	3	0	8	33	0	59	55	245	4	4	674	71
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	3	0	9	36	0	64	59	264	4	4	726	76
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	3	0	9	36	0	64	59	264	4	4	726	76
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	3	0	9	36	0	64	59	264	4	4	726	76
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.27	0.00	0.73	0.36	0.00	0.64	1.00	1.97	0.03	1.00	1.81	0.19
Final Sat.:	436	0	1164	574	0	1026	1600	3149	51	1600	2895	305
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.01	0.02	0.00	0.06	0.04	0.08	0.08	0.00	0.25	0.25
Crit Moves:	****					****	****				****	

```
--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                          Existing Plus Project
              Weekday Evening Peak Hour - With Improvements
--------------------------------------------------------------------------------

                   Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):          0.513
Loss Time (sec):      10 (Y+R=0.0 sec)  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:       100                Level Of Service:                   A
********************************************************************************
Street Name:       Project Central Access                Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        0  0  1! 0  0   0  0  1! 0  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      7     0     6    0     0     0    0   800     1    3   412     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   7     0     6    0     0     0    0   800     1    3   412     0
Added Vol:     0     0     0   48     0    87   58   136     0    0   112    92
PasserByVol:   0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:   7     0     6   48     0    87   58   936     1    3   524    92
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93
PHF Volume:    8     0     6   52     0    94   62  1008     1    3   564    99
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   8     0     6   52     0    94   62  1008     1    3   564    99
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   8     0     6   52     0    94   62  1008     1    3   564    99
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600  1600
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.54 0.00  0.46 0.36 0.00  0.64 1.00 1.99  0.01 1.00 1.70  0.30
Final Sat.:   862    0   738  569    0  1031 1600 3197     3 1600 2722   478
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.01 0.03 0.00  0.09 0.04 0.32  0.32 0.00 0.21  0.21
Crit Moves:  ****                       ****      ****       ****
********************************************************************************
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```
--------------------------------------------------------------------------------
                             Rowland Heights Plaza
                            Existing Plus Project
                     Saturday Peak Hour - With Improvements
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7
********************************************************************************
Cycle (sec):          100             Critical Vol./Cap.(X):          0.517
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100             Level Of Service:                   A
********************************************************************************
Street Name:       Project Central Access                Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  1! 0  0   0  0  1! 0  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       4    0     5    0    0     0    0  665     3    9  508     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    4    0     5    0    0     0    0  665     3    9  508     0
Added Vol:      0    0     0   60    0   110   74  168     0    0  150   116
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    4    0     5   60    0   110   74  833     3    9  658   116
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:     4    0     5   63    0   116   78  876     3    9  692   122
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    4    0     5   63    0   116   78  876     3    9  692   122
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    4    0     5   63    0   116   78  876     3    9  692   122
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600  1600
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.44 0.00  0.56 0.35 0.00  0.65 1.00 1.99  0.01 1.00 1.70  0.30
Final Sat.:   711    0   889  565    0  1035 1600 3189    11 1600 2720   480
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.01 0.04 0.00  0.11 0.05 0.27  0.27 0.01 0.25  0.25
Crit Moves:  ****                       **** ****                  ****
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Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #8 Project East Access (NS) at Gale Avenue (EW) - #8

Cycle (sec):	100	Critical Vol./Cap.(X):	0.511
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Project East Access						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 1! 0 0			0 0 1! 0 0			1 0 2 0 0			0 0 1 1 0		
Volume Module:												
Base Vol:	1	0	1	11	0	2	16	167	0	0	599	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	0	1	11	0	2	16	167	0	0	599	3
Added Vol:	0	0	0	101	0	25	59	60	0	0	125	92
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1	0	1	112	0	27	75	227	0	0	724	95
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	1	0	1	118	0	28	79	239	0	0	762	100
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1	0	1	118	0	28	79	239	0	0	762	100
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1	0	1	118	0	28	79	239	0	0	762	100
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.50	0.00	0.50	0.81	0.00	0.19	1.00	2.00	0.00	0.00	1.77	0.23
Final Sat.:	800	0	800	1289	0	311	1600	3200	0	0	2829	371
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.07	0.00	0.09	0.05	0.07	0.00	0.00	0.27	0.27
Crit Moves:	****					****	****				****	

Rowland Heights Plaza
Existing Plus Project
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #8 Project East Access (NS) at Gale Avenue (EW) - #8

Cycle (sec):	100	Critical Vol./Cap.(X):	0.662
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Project East Access						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 1! 0 0			0 1 0 0 1			1 0 1 1 0			1 0 1 1 0		
Volume Module:												
Base Vol:	1	0	1	72	0	74	105	800	0	0	419	21
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	0	1	72	0	74	105	800	0	0	419	21
Added Vol:	0	0	0	197	0	54	101	82	0	0	149	169
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1	0	1	269	0	128	206	882	0	0	568	190
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	1	0	1	283	0	135	217	928	0	0	598	200
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1	0	1	283	0	135	217	928	0	0	598	200
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1	0	1	283	0	135	217	928	0	0	598	200
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.50	0.00	0.50	1.00	0.00	1.00	1.00	2.00	0.00	1.00	1.50	0.50
Final Sat.:	800	0	800	1600	0	1600	1600	3200	0	1600	2398	802
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.18	0.00	0.08	0.14	0.29	0.00	0.00	0.25	0.25
Crit Moves:		****		****			****				****	

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------------------------------------------------------------------------------
                            Rowland Heights Plaza
                            Existing Plus Project
                             Saturday Peak Hour
------------------------------------------------------------------------------

                       Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
******************************************************************************
Intersection #8 Project East Access (NS) at Gale Avenue (EW) - #8
******************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.824
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100              Level Of Service:                  D
******************************************************************************
Street Name:          Project East Access                  Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         0  0  1! 0  0   0  1  0  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       1    0     1   93    0    96  136  672     0    0  517    27
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    1    0     1   93    0    96  136  672     0    0  517    27
Added Vol:      0    0     0  271    0    77  127  101     0    0  190   212
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    1    0     1  364    0   173  263  773     0    0  707   239
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:     1    0     1  383    0   182  277  814     0    0  744   252
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    1    0     1  383    0   182  277  814     0    0  744   252
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    1    0     1  383    0   182  277  814     0    0  744   252
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600  1600
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.50 0.00  0.50 1.00 0.00  1.00 1.00 2.00  0.00 1.00 1.49  0.51
Final Sat.:   800    0   800 1600    0  1600 1600 3200     0 1600 2392   808
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.24 0.00  0.11 0.17 0.25  0.00 0.00 0.31  0.31
Crit Moves:       ****       ****            ****                  ****
******************************************************************************
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Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #9 Nogales Street (NS) at Shadow Oak Drive (EW) - #9

Cycle (sec):	100	Critical Vol./Cap.(X):	0.702
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						Shadow Oak Drive					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2 0	1	1 0	2 0	1	1 0	1 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	134	741	126	45	681	28	52	101	194	188	97	96
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	134	741	126	45	681	28	52	101	194	188	97	96
Added Vol:	12	12	12	0	17	0	0	0	17	17	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	146	753	138	45	698	28	52	101	211	205	97	96
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	154	796	146	48	738	30	55	107	223	217	103	101
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	154	796	146	48	738	30	55	107	223	217	103	101
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	154	796	146	48	738	30	55	107	223	217	103	101
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.01	0.99
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	1600	1600	1600	1608	1592
Capacity Analysis Module:												
Vol/Sat:	0.10	0.25	0.09	0.03	0.23	0.02	0.03	0.07	0.14	0.14	0.06	0.06
Crit Moves:	****				****				****	****		

Rowland Heights Plaza
Existing Plus Project
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #9 Nogales Street (NS) at Shadow Oak Drive (EW) - #9

Cycle (sec):	100	Critical Vol./Cap.(X):	0.569
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Nogales Street						Shadow Oak Drive					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2 0	1	1 0	2 0	1	1 0	1 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	134	814	138	41	662	51	38	61	102	77	45	31
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	134	814	138	41	662	51	38	61	102	77	45	31
Added Vol:	21	21	21	0	23	0	0	0	23	23	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	155	835	159	41	685	51	38	61	125	100	45	31
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	161	868	165	43	712	53	40	63	130	104	47	32
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	161	868	165	43	712	53	40	63	130	104	47	32
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	161	868	165	43	712	53	40	63	130	104	47	32
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.18	0.82
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	1600	1600	1600	1895	1305
Capacity Analysis Module:												
Vol/Sat:	0.10	0.27	0.10	0.03	0.22	0.03	0.02	0.04	0.08	0.06	0.02	0.02
Crit Moves:	****				****				****	****		

Rowland Heights Plaza
Existing Plus Project
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #9 Nogales Street (NS) at Shadow Oak Drive (EW) - #9

Cycle (sec):	100	Critical Vol./Cap.(X):	0.585
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Nogales Street						Shadow Oak Drive					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2 0	1	1 0	2 0	1	1 0	1 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	106	703	91	18	664	38	37	23	136	86	20	30
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	106	703	91	18	664	38	37	23	136	86	20	30
Added Vol:	27	27	27	0	29	0	0	0	29	29	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	133	730	118	18	693	38	37	23	165	115	20	30
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	136	746	121	18	709	39	38	24	169	118	20	31
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	136	746	121	18	709	39	38	24	169	118	20	31
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	136	746	121	18	709	39	38	24	169	118	20	31
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	1600	1600	1600	1600	1600
Capacity Analysis Module:												
Vol/Sat:	0.08	0.23	0.08	0.01	0.22	0.02	0.02	0.01	0.11	0.07	0.01	0.02
Crit Moves:	****				****				****	****		

Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #10 Nogales Street (NS) at La Puente Road (EW) - #10

Cycle (sec):	100	Critical Vol./Cap.(X):	0.848
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	D

Street Name:	Nogales Street		La Puente Road	
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Split Phase	Split Phase
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	1 0 2 0 1	1 0 2 0 1	0 0 1! 0 0	0 1 0 0 1

	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Volume Module:												
Base Vol:	32	632	147	126	991	118	91	41	36	280	39	163
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	32	632	147	126	991	118	91	41	36	280	39	163
Added Vol:	0	37	12	0	50	0	0	0	0	17	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	32	669	159	126	1041	118	91	41	36	297	39	163
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
PHF Volume:	36	758	180	143	1179	134	103	46	41	336	44	185
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	36	758	180	143	1179	134	103	46	41	336	44	185
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	36	758	180	143	1179	134	103	46	41	336	44	185
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	0.55	0.24	0.21	0.88	0.12	1.00
Final Sat.:	1600	3200	1600	1600	3200	1600	867	390	343	1414	186	1600
Capacity Analysis Module:												
Vol/Sat:	0.02	0.24	0.11	0.09	0.37	0.08	0.12	0.12	0.12	0.24	0.24	0.12
Crit Moves:	****				****			****			****	

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--------------------------------------------------------------------------------
                            Rowland Heights Plaza
                            Existing Plus Project
                          Weekday Evening Peak Hour
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                      Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #10 Nogales Street (NS) at La Puente Road (EW) - #10
********************************************************************************
Cycle (sec):           100                Critical Vol./Cap.(X):         0.808
Loss Time (sec):        10 (Y+R=0.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         100                Level Of Service:                  D
********************************************************************************
Street Name:               Nogales Street                    La Puente Road
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Protected        Protected        Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         1  0  2  0  1    1  0  2  0  1    0  0  1!  0  0   0  1  0  0  1
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:         2   966   391   206   597    45    69    33    17   225    20   158
Growth Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:      2   966   391   206   597    45    69    33    17   225    20   158
Added Vol:        0    62    21     0    70     0     0     0     0    23     0     0
PasserByVol:      0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:      2  1028   412   206   667    45    69    33    17   248    20   158
User Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:       0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98
PHF Volume:       2  1052   422   211   683    46    71    34    17   254    20   162
Reduct Vol:       0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:      2  1052   422   211   683    46    71    34    17   254    20   162
PCE Adj:       1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:       1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:      2  1052   422   211   683    46    71    34    17   254    20   162
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:      1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:         1.00  2.00  1.00  1.00  2.00  1.00  0.58  0.28  0.14  0.93  0.07  1.00
Final Sat.:    1600  3200  1600  1600  3200  1600   928   444   229  1481   119  1600
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:       0.00  0.33  0.26  0.13  0.21  0.03  0.08  0.08  0.08  0.17  0.17  0.10
Crit Moves:          ****  ****                          ****        ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                              Rowland Heights Plaza
                             Existing Plus Project
                               Saturday Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #10 Nogales Street (NS) at La Puente Road (EW) - #10
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.819
Loss Time (sec):      10 (Y+R=0.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100                Level Of Service:                  D
********************************************************************************
Street Name:             Nogales Street                  La Puente Road
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         1  0  2  0  1   1  0  2  0  1   0  0  1! 0  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       8   760   246  191   767     1   26    14    34  390     1   158
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:    8   760   246  191   767     1   26    14    34  390     1   158
Added Vol:      0    82    27    0    88     0    0     0     0   29     0     0
PasserByVol:    0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:    8   842   273  191   855     1   26    14    34  419     1   158
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96
PHF Volume:     8   876   284  199   890     1   27    15    35  436     1   164
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:    8   876   284  199   890     1   27    15    35  436     1   164
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:    8   876   284  199   890     1   27    15    35  436     1   164
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       1.00  2.00  1.00 1.00  2.00  1.00 0.35  0.19  0.46 0.99  0.01  1.00
Final Sat.:  1600  3200  1600 1600  3200  1600  562   303   735 1596     4  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01  0.27  0.18 0.12  0.28  0.00 0.05  0.05  0.05 0.27  0.27  0.10
Crit Moves:        ****       ****                          ****       ****
********************************************************************************
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Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #11 Nogales Street (NS) at Valley Boulevard Loop (EW) - #11

Cycle (sec):	100	Critical Vol./Cap.(X):	0.654
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Nogales Street						Valley Boulevard Loop					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 2 1 0			1 0 2 1 0			0 0 1! 0 0			1 1 0 0 1		
Volume Module:												
Base Vol:	32	634	146	88	1132	156	48	18	32	180	1	222
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	32	634	146	88	1132	156	48	18	32	180	1	222
Added Vol:	0	49	18	0	66	0	0	0	0	24	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	32	683	164	88	1198	156	48	18	32	204	1	222
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	35	753	181	97	1321	172	53	20	35	225	1	245
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	35	753	181	97	1321	172	53	20	35	225	1	245
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	35	753	181	97	1321	172	53	20	35	225	1	245
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.42	0.58	1.00	2.65	0.35	0.49	0.18	0.33	1.99	0.01	1.00
Final Sat.:	1600	3871	929	1600	4247	553	784	294	522	3184	16	1600
Capacity Analysis Module:												
Vol/Sat:	0.02	0.19	0.19	0.06	0.31	0.31	0.07	0.07	0.07	0.07	0.07	0.15
Crit Moves:	****				****			****				****

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---------------------------------------------------------------------------------
                          Rowland Heights Plaza
                          Existing Plus Project
                        Weekday Evening Peak Hour
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                    Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*********************************************************************************
Intersection #11 Nogales Street  (NS) at Valley Boulevard Loop (EW) - #11
*********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):         0.655
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100               Level Of Service:                  B
*********************************************************************************
Street Name:             Nogales Street                Valley Boulevard Loop
Approach:        North Bound      South Bound       East Bound        West Bound
Movement:       L  -  T  -  R   L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:         Protected         Protected        Split Phase       Split Phase
Rights:            Include           Include           Include           Include
Min. Green:      0     0     0    0     0     0    0     0     0    0     0     0
Lanes:          1  0  2  1  0   1  0  2  1  0    0  0  1! 0  0    1  1  0  0  1
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      16 1225   222   74  622    43   30    4    13  121    2   211
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   16 1225   222   74  622    43   30    4    13  121    2   211
Added Vol:      0   83    33    0   93     0    0    0     0   38    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   16 1308   255   74  715    43   30    4    13  159    2   211
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96
PHF Volume:    17 1363   266   77  745    45   31    4    14  166    2   220
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   17 1363   266   77  745    45   31    4    14  166    2   220
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   17 1363   266   77  745    45   31    4    14  166    2   220
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600  1600
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 2.51  0.49 1.00 2.83  0.17 0.64 0.08  0.28 1.98 0.02  1.00
Final Sat.:  1600 4017   783 1600 4528   272 1021  136   443 3160   40  1600
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.34  0.34 0.05 0.16  0.16 0.03 0.03  0.03 0.05 0.05  0.14
Crit Moves:       ****       ****                    ****                   ****
*********************************************************************************
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                        Rowland Heights Plaza
                       Existing Plus Project
                        Saturday Peak Hour
--------------------------------------------------------------------------------
                  Level Of Service Computation Report
     ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #11 Nogales Street  (NS) at Valley Boulevard Loop (EW) - #11
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):          0.566
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100              Level Of Service:                   A
********************************************************************************
Street Name:                Nogales Street               Valley Boulevard Loop
Approach:          North Bound      South Bound       East Bound       West Bound
Movement:         L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|-----------------||-----------------||-----------------||-----------------|
Control:           Protected         Protected        Split Phase      Split Phase
Rights:             Include           Include           Include          Include
Min. Green:      0     0     0    0     0     0    0     0     0    0     0     0
Lanes:           1  0  2  1  0    1  0  2  1  0    0  0  1! 0  0    1  1  0  0  1
------------|-----------------||-----------------||-----------------||-----------------|
Volume Module:
Base Vol:       22  1004   122   86  1094    68   29     2    20  154     2   160
Growth Adj:   1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:    22  1004   122   86  1094    68   29     2    20  154     2   160
Added Vol:       0   109    44    0   118     0    0     0     0   48     0     0
PasserByVol:     0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:    22  1113   166   86  1212    68   29     2    20  202     2   160
User Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:      0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97
PHF Volume:     23  1147   171   89  1249    70   30     2    21  208     2   165
Reduct Vol:      0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:    23  1147   171   89  1249    70   30     2    21  208     2   165
PCE Adj:      1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:      1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:    23  1147   171   89  1249    70   30     2    21  208     2   165
------------|-----------------||-----------------||-----------------||-----------------|
Saturation Flow Module:
Sat/Lane:     1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:   1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:        1.00  2.61  0.39 1.00  2.84  0.16 0.57  0.04  0.39 1.98  0.02  1.00
Final Sat.:   1600  4177   623 1600  4545   255  910    63   627 3169    31  1600
------------|-----------------||-----------------||-----------------||-----------------|
Capacity Analysis Module:
Vol/Sat:      0.01  0.27  0.27 0.06  0.27  0.27 0.03  0.03  0.03 0.07  0.07  0.10
Crit Moves:         ****       ****             ****                          ****
********************************************************************************
```

Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #12 Valley Boulevard Loop (NS) at Valley Boulevard (EW) - #12

Cycle (sec):	100	Critical Vol./Cap.(X):	0.581
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Valley Boulevard Loop		Valley Boulevard	
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Permitted	Permitted	Protected	Permitted
Rights:	Include	Include	Include	Include
Lanes:	0 0 0 0 0	2 0 0 0 1	2 0 3 0 0	0 0 2 1 0

Movement:	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	0	0	0	101	0	151	181	512	0	0	996	251
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	101	0	151	181	512	0	0	996	251
Added Vol:	0	0	0	6	0	12	17	0	0	0	0	7
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	107	0	163	198	512	0	0	996	258
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	0	0	0	119	0	182	221	571	0	0	1110	288
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	119	0	182	221	571	0	0	1110	288
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	119	0	182	221	571	0	0	1110	288
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	2.00	0.00	1.00	2.00	3.00	0.00	0.00	2.38	0.62
Final Sat.:	0	0	0	2880	0	1600	2880	4800	0	0	3812	988
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.04	0.00	0.11	0.08	0.12	0.00	0.00	0.29	0.29
Crit Moves:						****	****				****	

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-------------------------------------------------------------------------------
                          Rowland Heights Plaza
                         Existing Plus Project
                        Weekday Evening Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*******************************************************************************
Intersection #12 Valley Boulevard Loop (NS) at Valley Boulevard (EW) - #12
*******************************************************************************
Cycle (sec):           100              Critical Vol./Cap.(X):          0.415
Loss Time (sec):        10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:         100              Level Of Service:                   A
*******************************************************************************
Street Name:       Valley Boulevard Loop                 Valley Boulevard
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected         Permitted
Rights:          Include          Include          Include           Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:          0  0  0  0  0    2  0  0  0  1    2  0  3  0  0    0  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0     0     0  211     0    90  102  1072     0    0   643   228
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:    0     0     0  211     0    90  102  1072     0    0   643   228
Added Vol:      0     0     0   12     0    21   23     0     0    0     0    15
PasserByVol:    0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:    0     0     0  223     0   111  125  1072     0    0   643   243
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97
PHF Volume:     0     0     0  230     0   115  129  1106     0    0   664   251
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:    0     0     0  230     0   115  129  1106     0    0   664   251
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:    0     0     0  230     0   115  129  1106     0    0   664   251
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  1.00  1.00  1.00 0.90  1.00  1.00 0.90  1.00  1.00 1.00  1.00  1.00
Lanes:       0.00  0.00  0.00 2.00  0.00  1.00 2.00  3.00  0.00 0.00  2.18  0.82
Final Sat.:     0     0     0 2880     0  1600 2880  4800     0    0  3484  1316
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00 0.08  0.00  0.07 0.04  0.23  0.00 0.00  0.19  0.19
Crit Moves:                   ****             ****                   ****
*******************************************************************************
```

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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                          Existing Plus Project
                           Saturday Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #12 Valley Boulevard Loop (NS) at Valley Boulevard (EW) - #12
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):         0.363
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100               Level Of Service:                  A
********************************************************************************
Street Name:      Valley Boulevard Loop                  Valley Boulevard
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Permitted         Permitted         Protected         Permitted
Rights:          Include           Include           Include           Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  0  0  0    2  0  0  0  1    2  0  3  0  0    0  0  2  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      0     0     0  128     0    87   94   429     0    0   465   188
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   0     0     0  128     0    87   94   429     0    0   465   188
Added Vol:     0     0     0   17     0    27   29     0     0    0     0    19
PasserByVol:   0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:   0     0     0  145     0   114  123   429     0    0   465   207
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97
PHF Volume:    0     0     0  150     0   118  127   444     0    0   481   214
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   0     0     0  150     0   118  127   444     0    0   481   214
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:   0     0     0  150     0   118  127   444     0    0   481   214
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  1.00  1.00  1.00 0.90  1.00  1.00 0.90  1.00  1.00 1.00  1.00  1.00
Lanes:       0.00  0.00  0.00 2.00  0.00  1.00 2.00  3.00  0.00 0.00  2.08  0.92
Final Sat.:    0     0     0 2880     0  1600 2880  4800     0    0  3321  1479
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00 0.05  0.00  0.07 0.04  0.09  0.00 0.00  0.14  0.14
Crit Moves:                               **** ****                     ****
********************************************************************************
```

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-------------------------------------------------------------------------------
                         Rowland Heights Plaza
                         Existing Plus Project
                       Weekday Morning Peak Hour
-------------------------------------------------------------------------------

                    Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*******************************************************************************
Intersection #13 Nogales Street (NS) at San Jose Avenue (EW) - #13
*******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):          0.661
Loss Time (sec):      10 (Y+R=0.0 sec)  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:       100                Level Of Service:                   B
*******************************************************************************
Street Name:             Nogales Street                  San Jose Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit       Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         1  0  2  1  0   1  0  2  1  0   1  0  0  1  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      226  983   100    69 1153    95     9   58    70    36  148    33
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   226  983   100    69 1153    95     9   58    70    36  148    33
Added Vol:       0   67     0     0   90     0     0    0     0     0    0     0
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   226 1050   100    69 1243    95     9   58    70    36  148    33
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.10 1.00  1.10  1.10 1.00  1.10
PHF Adj:      0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:    233 1084   103    71 1283    98    10   60    79    41  153    37
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   233 1084   103    71 1283    98    10   60    79    41  153    37
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   233 1084   103    71 1283    98    10   60    79    41  153    37
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:        1.00 2.74  0.26  1.00 2.79  0.21  1.00 0.43  0.57  0.21 0.79  1.00
Final Sat.:   1600 4383   417  1600 4459   341  1600  687   913   338 1262  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.15 0.25  0.25  0.04 0.29  0.29  0.01 0.09  0.09  0.03 0.12  0.02
Crit Moves:   ****                   ****       ****                   ****
*******************************************************************************
```

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--------------------------------------------------------------------------------
                           Rowland Heights Plaza
                          Existing Plus Project
                        Weekday Evening Peak Hour
--------------------------------------------------------------------------------

                     Level Of Service Computation Report
     ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #13 Nogales Street (NS) at San Jose Avenue (EW) - #13
********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):         0.921
Loss Time (sec):       10 (Y+R=0.0 sec)   Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100                 Level Of Service:                  E
********************************************************************************
Street Name:                Nogales Street                   San Jose Avenue
Approach:        North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit        Permitted         Permitted         Permitted
Rights:           Include           Include           Include           Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        1  0  2  1  0   1  0  2  1  0   1  0  0  1  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      60 1208    57    48  891    48   122  309   233    88   87    62
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   60 1208    57    48  891    48   122  309   233    88   87    62
Added Vol:      0  116     0     0  131     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   60 1324    57    48 1022    48   122  309   233    88   87    62
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.10 1.00  1.10  2.00 1.00  2.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    63 1392    60    50 1075    50   141  325   270   185   91   130
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   63 1392    60    50 1075    50   141  325   270   185   91   130
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   63 1392    60    50 1075    50   141  325   270   185   91   130
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 2.88  0.12  1.00 2.87  0.13  1.00 0.55  0.45  0.67 0.33  1.00
Final Sat.:  1600 4602   198  1600 4585   215  1600  875   725  1071  529  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.30  0.30  0.03 0.23  0.23  0.09 0.37  0.37  0.12 0.17  0.08
Crit Moves:       ****        ****                   ****        ****
********************************************************************************
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Rowland Heights Plaza
Existing Plus Project
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #13 Nogales Street (NS) at San Jose Avenue (EW) - #13

Cycle (sec):	100	Critical Vol./Cap.(X):	0.606
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Nogales Street						San Jose Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2 1	0	1 0	2 1	0	1 0	0 1	0	0 1	0 0	1
Volume Module:												
Base Vol:	77	1027	160	38	1150	53	16	42	33	147	61	64
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	77	1027	160	38	1150	53	16	42	33	147	61	64
Added Vol:	0	154	0	0	166	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	77	1181	160	38	1316	53	16	42	33	147	61	64
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.00	1.10	1.10	1.00	1.10
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	81	1235	167	40	1377	55	18	44	38	169	64	74
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	81	1235	167	40	1377	55	18	44	38	169	64	74
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	81	1235	167	40	1377	55	18	44	38	169	64	74
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.64	0.36	1.00	2.88	0.12	1.00	0.54	0.46	0.73	0.27	1.00
Final Sat.:	1600	4227	573	1600	4614	186	1600	858	742	1162	438	1600
Capacity Analysis Module:												
Vol/Sat:	0.05	0.29	0.29	0.02	0.30	0.30	0.01	0.05	0.05	0.11	0.15	0.05
Crit Moves:	****				****			****		****		

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------------------------------------------------------------------------------
                             Rowland Heights Plaza
                             Existing Plus Project
                           Weekday Morning Peak Hour
------------------------------------------------------------------------------

                       Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
******************************************************************************
Intersection #15 Nogales Street (NS) at Gale Avenue/Walnut Drive (EW) - #15
******************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.934
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100                Level Of Service:                 E
******************************************************************************
Street Name:               Nogales Street              Gale Avenue/Walnut Drive
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Prot+Permit      Prot+Permit
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       1  0  2  1  0   1  0  2  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     291 1330   168   183  913   146    49   73    55   104  228   146
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  291 1330   168   183  913   146    49   73    55   104  228   146
Added Vol:    116    0     0     0    0    90    67    0    85     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  407 1330   168   183  913   236   116   73   140   104  228   146
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:   424 1387   175   191  952   246   121   76   146   108  238   152
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  424 1387   175   191  952   246   121   76   146   108  238   152
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  424 1387   175   191  952   246   121   76   146   108  238   152
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 2.66  0.34  1.00 2.38  0.62  1.00 0.34  0.66  1.00 0.61  0.39
Final Sat.:  1600 4262   538  1600 3814   986  1600  548  1052  1600  975   625
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.27 0.33  0.33  0.12 0.25  0.25  0.08 0.14  0.14  0.07 0.24  0.24
Crit Moves:  ****                  ****        ****                   ****
******************************************************************************
```

Rowland Heights Plaza
Existing Plus Project
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #15 Nogales Street (NS) at Gale Avenue/Walnut Drive (EW) - #15

Cycle (sec):	100	Critical Vol./Cap.(X):	1.358
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	F

Street Name:	Nogales Street						Gale Avenue/Walnut Drive					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Prot+Permit			Prot+Permit		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 2 1 0			1 0 2 1 0			1 0 0 1 0			1 0 0 1 0		
Volume Module:												
Base Vol:	217	991	70	120	1088	97	239	341	366	227	236	91
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	217	991	70	120	1088	97	239	341	366	227	236	91
Added Vol:	163	0	0	0	0	131	116	0	145	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	380	991	70	120	1088	228	355	341	511	227	236	91
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	403	1051	74	127	1154	242	376	362	542	241	250	97
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	403	1051	74	127	1154	242	376	362	542	241	250	97
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	403	1051	74	127	1154	242	376	362	542	241	250	97
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.80	0.20	1.00	2.48	0.52	1.00	0.40	0.60	1.00	0.72	0.28
Final Sat.:	1600	4483	317	1600	3968	832	1600	640	960	1600	1155	445
Capacity Analysis Module:												
Vol/Sat:	0.25	0.23	0.23	0.08	0.29	0.29	0.24	0.56	0.56	0.15	0.22	0.22
Crit Moves:	****				****			****		****		

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------------------------------------------------------------------------------
                              Rowland Heights Plaza
                              Existing Plus Project
                               Saturday Peak Hour
------------------------------------------------------------------------------
                        Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
******************************************************************************
Intersection #15 Nogales Street (NS) at Gale Avenue/Walnut Drive (EW) - #15
******************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         1.291
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100              Level Of Service:                  F
******************************************************************************
Street Name:               Nogales Street              Gale Avenue/Walnut Drive
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Prot+Permit      Prot+Permit
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        1  0  2  1  0   1  0  2  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      278 1055   99   100  949  215   202  216  381   149  321   89
Growth Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   278 1055   99   100  949  215   202  216  381   149  321   89
Added Vol:     206    0    0     0    0  166   154    0  191     0    0    0
PasserByVol:     0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:   484 1055   99   100  949  381   356  216  572   149  321   89
User Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:      0.98 0.98 0.98  0.98 0.98 0.98  0.98 0.98 0.98  0.98 0.98 0.98
PHF Volume:    495 1079  101   102  970  390   364  221  585   152  328   91
Reduct Vol:      0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   495 1079  101   102  970  390   364  221  585   152  328   91
PCE Adj:      1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:      1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:   495 1079  101   102  970  390   364  221  585   152  328   91
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600
Adjustment:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:        1.00 2.74 0.26  1.00 2.14 0.86  1.00 0.27 0.73  1.00 0.78 0.22
Final Sat.:   1600 4388  412  1600 3425 1375  1600  439 1161  1600 1253  347
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.31 0.25 0.25  0.06 0.28 0.28  0.23 0.50 0.50  0.10 0.26 0.26
Crit Moves:   ****                 ****             ****        ****
******************************************************************************
```

Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16

Cycle (sec):	100	Critical Vol./Cap.(X):	0.679
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Nogales Street						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	3	0 1	0 0	3	0 1	0 0	0	0 0	0 0	1!	0 1
Volume Module:												
Base Vol:	0	1169	281	0	848	223	0	0	0	290	0	621
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1169	281	0	848	223	0	0	0	290	0	621
Added Vol:	0	57	0	0	85	0	0	0	0	0	0	59
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1226	281	0	933	223	0	0	0	290	0	680
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.00	0.97	0.97	0.00	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	0	1270	0	0	967	0	0	0	0	301	0	705
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1270	0	0	967	0	0	0	0	301	0	705
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1270	0	0	967	0	0	0	0	301	0	705
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	0.00	0.00	0.00	0.59	0.01	1.40
Final Sat.:	0	4800	1600	0	4800	1600	0	0	0	957	0	2243
Capacity Analysis Module:												
Vol/Sat:	0.00	0.26	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.19	0.00	0.31
Crit Moves:		****		****								****

Rowland Heights Plaza
Existing Plus Project
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16

Cycle (sec):	100	Critical Vol./Cap.(X):	0.663
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Nogales Street						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	3 0	1	0 0	3 0	1	0 0	0 0	0	0 0	1! 0	1
Volume Module:												
Base Vol:	0	1019	216	0	1226	454	0	0	0	383	0	262
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1019	216	0	1226	454	0	0	0	383	0	262
Added Vol:	0	85	0	0	145	0	0	0	0	0	0	78
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1104	216	0	1371	454	0	0	0	383	0	340
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.00	0.93	0.93	0.00	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	1183	0	0	1469	0	0	0	0	411	0	364
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1183	0	0	1469	0	0	0	0	411	0	364
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1183	0	0	1469	0	0	0	0	411	0	364
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	4800	1600	0	4800	1600	0	0	0	1600	0	1600
Capacity Analysis Module:												
Vol/Sat:	0.00	0.25	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.26	0.00	0.23
Crit Moves:	****				****					****		

Rowland Heights Plaza
Existing Plus Project
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16

Cycle (sec):	100	Critical Vol./Cap.(X):	0.699
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Nogales Street						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	3 0	1	0 0	3 0	1	0 0	0 0	0	0 0	1! 0	1
Volume Module:												
Base Vol:	0	991	364	0	1125	401	0	0	0	435	0	418
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	991	364	0	1125	401	0	0	0	435	0	418
Added Vol:	0	107	0	0	191	0	0	0	0	0	0	99
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1098	364	0	1316	401	0	0	0	435	0	517
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.00	0.95	0.95	0.00	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	1151	0	0	1379	0	0	0	0	456	0	542
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1151	0	0	1379	0	0	0	0	456	0	542
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1151	0	0	1379	0	0	0	0	456	0	542
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	0.00	0.00	0.00	0.91	0.00	1.09
Final Sat.:	0	4800	1600	0	4800	1600	0	0	0	1462	0	1738
Capacity Analysis Module:												
Vol/Sat:	0.00	0.24	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.28	0.00	0.31
Crit Moves:	****				****							****

Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

```
********************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.562
Loss Time (sec):      10 (Y+R=0.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100                Level Of Service:                  A
********************************************************************************
Street Name:              Nogales Street               SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted         Permitted        Permitted
Rights:           Ignore           Ignore           Include          Include
Min. Green:    0     0     0   0     0     0   0     0     0   0     0     0
Lanes:         0  0  3  0  1   0  0  3  0  1   1  0  1! 0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        0 1049   387     0  926   212   401     0   243     0     0     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0 1049   387     0  926   212   401     0   243     0     0     0
Added Vol:       0   57     0     0   42    43     0     0     0     0     0     0
PasserByVol:     0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:     0 1106   387     0  968   255   401     0   243     0     0     0
User Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.94 0.94  0.00  0.94 0.94  0.00  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:      0 1183     0     0 1035     0   429     0   260     0     0     0
Reduct Vol:      0    0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:     0 1183     0     0 1035     0   429     0   260     0     0     0
PCE Adj:      1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:     0 1183     0     0 1035     0   429     0   260     0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:        0.00 3.00  1.00  0.00 3.00  1.00  1.24 0.01  0.75  0.00 0.00  0.00
Final Sat.:      0 4800  1600     0 4800  1600  1993    0  1207     0     0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.00 0.25  0.00  0.00 0.22  0.00  0.22 0.00  0.22  0.00 0.00  0.00
Crit Moves:        ****        ****             ****
********************************************************************************
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--------------------------------------------------------------------------------
                              Rowland Heights Plaza
                              Existing Plus Project
                            Weekday Evening Peak Hour
--------------------------------------------------------------------------------
                         Level Of Service Computation Report
         ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):          0.701
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100                Level Of Service:                   C
********************************************************************************
Street Name:               Nogales Street                SR-60 Freeway EB Ramps
Approach:          North Bound       South Bound       East Bound        West Bound
Movement:        L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:          Permitted         Permitted         Permitted         Permitted
Rights:             Ignore            Ignore           Include           Include
Min. Green:      0     0     0    0     0     0    0     0     0    0     0     0
Lanes:           0  0  3  0  1    0  0  3  0  1    1  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        0   840   288    0  1322   287  397     0   420    0     0     0
Growth Adj:   1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:     0   840   288    0  1322   287  397     0   420    0     0     0
Added Vol:       0    85     0    0    74    71    0     0     0    0     0     0
PasserByVol:     0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:     0   925   288    0  1396   358  397     0   420    0     0     0
User Adj:     1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:      0.92  0.92  0.00 0.92  0.92  0.00 0.92  0.92  0.92 0.92  0.92  0.92
PHF Volume:      0  1004     0    0  1516     0  431     0   456    0     0     0
Reduct Vol:      0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:     0  1004     0    0  1516     0  431     0   456    0     0     0
PCE Adj:      1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:      1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:     0  1004     0    0  1516     0  431     0   456    0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:   1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:        0.00  3.00  1.00 0.00  3.00  1.00 1.00  0.00  1.00 0.00  0.00  0.00
Final Sat.:      0  4800  1600    0  4800  1600 1600     0  1600    0     0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.00  0.21  0.00 0.00  0.32  0.00 0.27  0.00  0.29 0.00  0.00  0.00
Crit Moves:   ****                    ****                    ****
********************************************************************************
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--------------------------------------------------------------------------------
                            Rowland Heights Plaza
                            Existing Plus Project
                             Saturday Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.618
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  B
********************************************************************************
Street Name:                Nogales Street               SR-60 Freeway EB Ramps
Approach:         North Bound      South Bound      East Bound       West Bound
Movement:        L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:          Permitted        Permitted        Permitted        Permitted
Rights:            Ignore           Ignore           Include          Include
Min. Green:      0    0     0    0    0     0    0    0     0    0    0     0
Lanes:           0  0  3  0  1   0  0  3  0  1   1  0  1! 0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        0  947   423     0 1160   370   415    0   352     0    0     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0  947   423     0 1160   370   415    0   352     0    0     0
Added Vol:       0  107     0     0   99    92     0    0     0     0    0     0
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:     0 1054   423     0 1259   462   415    0   352     0    0     0
User Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.97 0.97  0.00  0.97 0.97  0.00  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:      0 1087     0     0 1298     0   428    0   363     0    0     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:     0 1087     0     0 1298     0   428    0   363     0    0     0
PCE Adj:      1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:     0 1087     0     0 1298     0   428    0   363     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:        0.00 3.00  1.00  0.00 3.00  1.00  1.08 0.00  0.92  0.00 0.00  0.00
Final Sat.:      0 4800  1600     0 4800  1600  1731    0  1469     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.00 0.23  0.00  0.00 0.27  0.00  0.25 0.00  0.25  0.00 0.00  0.00
Crit Moves:   ****                  ****        ****
********************************************************************************
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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                          Existing Plus Project
                        Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #18 Nogales Street (NS) at Colima Road (EW)
********************************************************************************
Cycle (sec):           100               Critical Vol./Cap.(X):         0.841
Loss Time (sec):        10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         100               Level Of Service:                  D
********************************************************************************
Street Name:              Nogales Street                   Colima Road
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include            Ovl            Include          Include
Min. Green:    0     0     0   0     0     0   0     0     0   0     0     0
Lanes:         2  0  2  0  1   2  0  2  0  1   2  0  2  1  0   2  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     313   741   137  248   626   244  356   576   202  180   668   333
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:  313   741   137  248   626   244  356   576   202  180   668   333
Added Vol:      0    24     0   12    18    12   17     0     0    0     0    17
PasserByVol:    0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:  313   765   137  260   644   256  373   576   202  180   668   350
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92
PHF Volume:   342   836   150  284   704   280  408   630   221  197   730   383
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:  342   836   150  284   704   280  408   630   221  197   730   383
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:  342   836   150  284   704   280  408   630   221  197   730   383
OvlAdjVol:                                  53
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  0.90  1.00  1.00 0.90  1.00  1.00 0.90  1.00  1.00 0.90  1.00  1.00
Lanes:       2.00  2.00  1.00 2.00  2.00  1.00 2.00  2.22  0.78 2.00  2.00  1.00
Final Sat.:  2880  3200  1600 2880  3200  1600 2880  3554  1246 2880  3200  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12  0.26  0.09 0.10  0.22  0.17 0.14  0.18  0.18 0.07  0.23  0.24
OvlAdjV/S:                                0.03
Crit Moves:        ****       ****             ****                         ****
********************************************************************************
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Rowland Heights Plaza
Existing Plus Project
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #18 Nogales Street (NS) at Colima Road (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.752
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						Colima Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Include			Ovl			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0 2 0 1			2 0 2 0 1			2 0 2 1 0			2 0 2 1 0		
Volume Module:												
Base Vol:	231	531	163	440	769	386	335	889	197	186	609	224
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	231	531	163	440	769	386	335	889	197	186	609	224
Added Vol:	0	38	0	21	33	21	23	0	0	0	0	23
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	231	569	163	461	802	407	358	889	197	186	609	247
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	235	579	166	469	816	414	364	904	200	189	620	251
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	235	579	166	469	816	414	364	904	200	189	620	251
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	235	579	166	469	816	414	364	904	200	189	620	251
OvlAdjVol:						212						
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	2.46	0.54	2.00	2.13	0.87
Final Sat.:	2880	3200	1600	2880	3200	1600	2880	3929	871	2880	3415	1385
Capacity Analysis Module:												
Vol/Sat:	0.08	0.18	0.10	0.16	0.25	0.26	0.13	0.23	0.23	0.07	0.18	0.18
OvlAdjV/S:						0.13						
Crit Moves:		****		****			****				****	

Rowland Heights Plaza
Existing Plus Project
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

****

Intersection #18 Nogales Street (NS) at Colima Road (EW)

****

Cycle (sec):	100	Critical Vol./Cap.(X):	0.868
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	D

****

Street Name:	Nogales Street						Colima Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	2 0	1	2 0	2 0	1	2 0	2 1	0	2 0	2 1	0
Volume Module:												
Base Vol:	269	533	118	376	527	512	461	733	183	150	769	283
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	269	533	118	376	527	512	461	733	183	150	769	283
Added Vol:	0	48	0	27	44	27	29	0	0	0	0	29
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	269	581	118	403	571	539	490	733	183	150	769	312
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	288	623	126	432	612	578	525	786	196	161	824	334
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	288	623	126	432	612	578	525	786	196	161	824	334
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	288	623	126	432	612	578	525	786	196	161	824	334
OvlAdjVol:						286						
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	2.40	0.60	2.00	2.13	0.87
Final Sat.:	2880	3200	1600	2880	3200	1600	2880	3841	959	2880	3415	1385
Capacity Analysis Module:												
Vol/Sat:	0.10	0.19	0.08	0.15	0.19	0.36	0.18	0.20	0.20	0.06	0.24	0.24
OvlAdjV/S:						0.18						
Crit Moves:		****		****			****				****	

****

Existing Plus Project Plus Cumulative

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1

Cycle (sec):	100	Critical Vol./Cap.(X):	0.673
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Fullerton Road						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	2 0	1	1 0	2 1	0	1 0	2 0	1	1 0	1 1	0
Volume Module:												
Base Vol:	476	875	186	35	373	147	163	203	186	50	350	40
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	476	875	186	35	373	147	163	203	186	50	350	40
Added Vol:	1	2	109	17	2	0	0	0	1	80	0	12
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	477	877	295	52	375	147	163	203	187	130	350	52
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	512	941	317	56	402	158	175	218	201	139	376	56
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	512	941	317	56	402	158	175	218	201	139	376	56
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	512	941	317	56	402	158	175	218	201	139	376	56
OvlAdjVol:			177						0			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	1.00	2.16	0.84	1.00	2.00	1.00	1.00	1.74	0.26
Final Sat.:	2880	3200	1600	1600	3448	1352	1600	3200	1600	1600	2786	414
Capacity Analysis Module:												
Vol/Sat:	0.18	0.29	0.20	0.03	0.12	0.12	0.11	0.07	0.13	0.09	0.13	0.13
OvlAdjV/S:			0.11						0.00			
Crit Moves:		****		****			****				****	

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---------------------------------------------------------------------------------
                              Rowland Heights Plaza
                 Existing Plus Project Plus Cumulative Projects
                              Weekday Evening Peak Hour
---------------------------------------------------------------------------------

                         Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*********************************************************************************
Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1
*********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.731
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100              Level Of Service:                  C
*********************************************************************************
Street Name:               Fullerton Road                     Gale Avenue
Approach:        North Bound      South Bound       East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected        Protected        Protected
Rights:             Ovl             Include            Ovl            Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:          2  0  2  0  1    1  0  2  1  0    1  0  2  0  1    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      342   531   142    52   494   177   226   477   397   172   331    56
Growth Adj:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   342   531   142    52   494   177   226   477   397   172   331    56
Added Vol:       1     2   148    23     3     0     0     0     1   133     0    21
PasserByVol:     0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   343   533   290    75   497   177   226   477   398   305   331    77
User Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:      0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95
PHF Volume:    361   562   306    79   524   187   238   503   419   321   349    81
Reduct Vol:      0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   361   562   306    79   524   187   238   503   419   321   349    81
PCE Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:   361   562   306    79   524   187   238   503   419   321   349    81
OvlAdjVol:                   0                                   219
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:   0.90  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:        2.00  2.00  1.00  1.00  2.21  0.79  1.00  2.00  1.00  1.00  1.62  0.38
Final Sat.:   2880  3200  1600  1600  3539  1261  1600  3200  1600  1600  2596   604
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.13  0.18  0.19  0.05  0.15  0.15  0.15  0.16  0.26  0.20  0.13  0.13
OvlAdjV/S:                0.00                                  0.14
Crit Moves:   ****                    ****              ****        ****
*********************************************************************************
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---------------------------------------------------------------------------
                          Rowland Heights Plaza
               Existing Plus Project Plus Cumulative Projects
                           Saturday Peak Hour
---------------------------------------------------------------------------
                    Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
***************************************************************************
Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1
***************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):        0.879
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       100              Level Of Service:                 D
***************************************************************************
Street Name:              Fullerton Road                 Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:            Ovl              Include          Ovl              Include
Min. Green:   0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        2  0  2  0  1   1  0  2  1  0   1  0  2  0  1   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     592  376   271    46  414   320   235  415   507   176  334    45
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  592  376   271    46  414   320   235  415   507   176  334    45
Added Vol:      2    3   187    29    3     0     0    0     2   174    0    27
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  594  379   458    75  417   320   235  415   509   350  334    72
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:   613  391   473    77  430   330   243  428   525   361  345    74
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  613  391   473    77  430   330   243  428   525   361  345    74
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  613  391   473    77  430   330   243  428   525   361  345    74
OvlAdjVol:               111                                185
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  0.90 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       2.00 2.00  1.00  1.00 2.00  1.00  1.00 2.00  1.00  1.00 1.65  0.35
Final Sat.:  2880 3200  1600  1600 3200  1600  1600 3200  1600  1600 2633   567
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.21 0.12  0.30  0.05 0.13  0.21  0.15 0.13  0.33  0.23 0.13  0.13
OvlAdjV/S:              0.07                                0.12
Crit Moves:  ****                        ****        ****        ****
***************************************************************************
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Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Morning Peak Hour - With Improvements

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1

Cycle (sec):	100	Critical Vol./Cap.(X):	0.673
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Fullerton Road						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0 2 0 1			1 0 2 1 0			1 0 2 0 1			2 0 1 1 0		
Volume Module:												
Base Vol:	476	875	186	35	373	147	163	203	186	50	350	40
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	476	875	186	35	373	147	163	203	186	50	350	40
Added Vol:	1	2	109	17	2	0	0	0	1	80	0	12
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	477	877	295	52	375	147	163	203	187	130	350	52
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	512	941	317	56	402	158	175	218	201	139	376	56
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	512	941	317	56	402	158	175	218	201	139	376	56
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	512	941	317	56	402	158	175	218	201	139	376	56
OvlAdjVol:			239						0			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00
Lanes:	2.00	2.00	1.00	1.00	2.16	0.84	1.00	2.00	1.00	2.00	1.74	0.26
Final Sat.:	2880	3200	1600	1600	3448	1352	1600	3200	1600	2880	2786	414
Capacity Analysis Module:												
Vol/Sat:	0.18	0.29	0.20	0.03	0.12	0.12	0.11	0.07	0.13	0.05	0.13	0.13
OvlAdjV/S:			0.15						0.00			
Crit Moves:		****		****			****				****	

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-------------------------------------------------------------------------------
                          Rowland Heights Plaza
              Existing Plus Project Plus Cumulative Projects
               Weekday Evening Peak Hour - With Improvements
-------------------------------------------------------------------------------

                    Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*******************************************************************************
Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1
*******************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):        0.657
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100              Level Of Service:                 B
*******************************************************************************
Street Name:              Fullerton Road                    Gale Avenue
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Protected        Protected        Protected        Protected
Rights:            Ovl            Include            Ovl            Include
Min. Green:   0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        2  0  2  0  1   1  0  2  1  0   1  0  2  0  1   2  0  1  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:    342  531   142    52  494   177   226  477   397   172  331    56
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse: 342  531   142    52  494   177   226  477   397   172  331    56
Added Vol:     1    2   148    23    3     0     0    0     1   133    0    21
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut: 343  533   290    75  497   177   226  477   398   305  331    77
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:  361  562   306    79  524   187   238  503   419   321  349    81
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 361  562   306    79  524   187   238  503   419   321  349    81
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume: 361  562   306    79  524   187   238  503   419   321  349    81
OvlAdjVol:              127                                219
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:   1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment: 0.90 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  0.90 1.00  1.00
Lanes:      2.00 2.00  1.00  1.00 2.21  0.79  1.00 2.00  1.00  2.00 1.62  0.38
Final Sat.: 2880 3200  1600  1600 3539  1261  1600 3200  1600  2880 2596   604
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:    0.13 0.18  0.19  0.05 0.15  0.15  0.15 0.16  0.26  0.11 0.13  0.13
OvlAdjV/S:             0.08                                0.14
Crit Moves: ****                  ****        ****                    ****
*******************************************************************************
```

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Saturday Peak Hour - With Improvements

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Fullerton Road (NS) at Gale Avenue (EW) - #1

Cycle (sec):	100	Critical Vol./Cap.(X):	0.802
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	D

Street Name:	Fullerton Road						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0 2 0 1			1 0 2 1 0			1 0 2 0 1			2 0 1 1 0		
Volume Module:												
Base Vol:	592	376	271	46	414	320	235	415	507	176	334	45
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	592	376	271	46	414	320	235	415	507	176	334	45
Added Vol:	2	3	187	29	3	0	0	0	2	174	0	27
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	594	379	458	75	417	320	235	415	509	350	334	72
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	613	391	473	77	430	330	243	428	525	361	345	74
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	613	391	473	77	430	330	243	428	525	361	345	74
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	613	391	473	77	430	330	243	428	525	361	345	74
OvlAdjVol:			272						185			
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00
Lanes:	2.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00	2.00	1.65	0.35
Final Sat.:	2880	3200	1600	1600	3200	1600	1600	3200	1600	2880	2633	567
Capacity Analysis Module:												
Vol/Sat:	0.21	0.12	0.30	0.05	0.13	0.21	0.15	0.13	0.33	0.13	0.13	0.13
OvlAdjV/S:			0.17						0.12			
Crit Moves:	****					****	****				****	

```
--------------------------------------------------------------------------------
                           Rowland Heights Plaza
             Existing Plus Project Plus Cumulative Projects
                        Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.562
Loss Time (sec):      10 (Y+R=0.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100                Level Of Service:                  A
********************************************************************************
Street Name:               Fullerton Road              SR-60 Freeway WB Ramps
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Ignore           Include          Include          Include
Min. Green:    0     0     0   0     0     0   0     0     0   0     0     0
Lanes:         0  0  3  0  1   0  0  3  0  0   0  0  0  0  0   1  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1004   323     0  604     0     0    0     0   391    0   573
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1004   323     0  604     0     0    0     0   391    0   573
Added Vol:      0  112     3     0   84     0     0    0     0     4    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 1116   326     0  688     0     0    0     0   395    0   573
User Adj:    1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.00  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:     0 1188     0     0  733     0     0    0     0   421    0   610
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1188     0     0  733     0     0    0     0   421    0   610
PCE Adj:     1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 1188     0     0  733     0     0    0     0   421    0   610
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 3.00  1.00  0.00 3.00  0.00  0.00 0.00  0.00  1.22 xxxx  1.78
Final Sat.:     0 4800  1600     0 4800     0     0    0     0  1959    0  2841
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.25  0.00  0.00 0.15  0.00  0.00 0.00  0.00  0.21 0.00  0.21
Crit Moves:       ****        ****                               ****
********************************************************************************
```

```
-----------------------------------------------------------------------------
                         Rowland Heights Plaza
            Existing Plus Project Plus Cumulative Projects
                       Weekday Evening Peak Hour
-----------------------------------------------------------------------------
                   Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*****************************************************************************
Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2
*****************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.501
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100              Level Of Service:                  A
*****************************************************************************
Street Name:              Fullerton Road              SR-60 Freeway WB Ramps
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Permitted        Permitted        Permitted        Permitted
Rights:          Ignore          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       0  0  3  0  1   0  0  3  0  0   0  0  0  0  0   1  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  709   532     0 1049     0     0    0     0   368    0   334
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  709   532     0 1049     0     0    0     0   368    0   334
Added Vol:     0  151     4     0  137     0     0    0     0     4    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0  860   536     0 1186     0     0    0     0   372    0   334
User Adj:   1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    0.98 0.98  0.00  0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98
PHF Volume:    0  875     0     0 1207     0     0    0     0   378    0   340
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0  875     0     0 1207     0     0    0     0   378    0   340
PCE Adj:    1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   0  875     0     0 1207     0     0    0     0   378    0   340
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:      0.00 3.00  1.00  0.00 3.00  0.00  0.00 0.00  0.00  1.58 xxxx  1.42
Final Sat.:    0 4800  1600     0 4800     0     0    0     0  2529    0  2271
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00 0.18  0.00  0.00 0.25  0.00  0.00 0.00  0.00  0.15 0.00  0.15
Crit Moves: ****                   ****                         ****
*****************************************************************************
```

```
-----------------------------------------------------------------------------
                          Rowland Heights Plaza
              Existing Plus Project Plus Cumulative Projects
                           Saturday Peak Hour
-----------------------------------------------------------------------------

                    Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*****************************************************************************
Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2
*****************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.606
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100                Level Of Service:                  B
*****************************************************************************
Street Name:             Fullerton Road              SR-60 Freeway WB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Ignore          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       0  0  3  0  1    0  0  3  0  0    0  0  0  0  0    1  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0   744   579     0  1097     0     0     0     0   549     0   494
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   0   744   579     0  1097     0     0     0     0   549     0   494
Added Vol:     0   191     6     0   179     0     0     0     0     5     0     0
PasserByVol:   0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   0   935   585     0  1276     0     0     0     0   554     0   494
User Adj:    1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.96  0.96  0.00  0.96  0.96  0.96  0.96  0.96  0.96  0.96  0.96  0.96
PHF Volume:    0   978     0     0  1335     0     0     0     0   579     0   517
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   0   978     0     0  1335     0     0     0     0   579     0   517
PCE Adj:     1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:   0   978     0     0  1335     0     0     0     0   579     0   517
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       0.00  3.00  1.00  0.00  3.00  0.00  0.00  0.00  0.00  1.58  0.01  1.41
Final Sat.:    0  4800  1600     0  4800     0     0     0     0  2537     0  2263
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.20  0.00  0.00  0.28  0.00  0.00  0.00  0.00  0.23  0.00  0.23
Crit Moves:  ****                    ****                          ****
*****************************************************************************
```

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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                Existing Plus Project Plus Cumulative Projects
                          Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                     Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.713
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100              Level Of Service:                  C
********************************************************************************
Street Name:              Fullerton Road                SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Protected       Split Phase      Split Phase
Rights:          Include          Ignore           Ignore          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        0  0  1  1  0   1  0  2  0  1   1  1  0  0  1   2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1278    15    12  684   217   410   10   552     5    0    18
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1278    15    12  684   217   410   10   552     5    0    18
Added Vol:      0   50    13     7   37     0    59    4     1    10    0     8
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 1328    28    19  721   217   469   14   553    15    0    26
User Adj:    1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
PHF Adj:     0.98 0.98  0.98  0.98 0.98  0.00  0.98 0.98  0.00  0.98 0.98  0.98
PHF Volume:     0 1350    28    19  733     0   477   14     0    15    0    26
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1350    28    19  733     0   477   14     0    15    0    26
PCE Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
FinalVolume:    0 1350    28    19  733     0   477   14     0    15    0    26
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  0.90 1.00  1.00
Lanes:       0.00 1.96  0.04  1.00 2.00  1.00  1.94 0.06  1.00  2.00 0.00  1.00
Final Sat.:     0 3134    66  1600 3200  1600  3107   93  1600  2880    0  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.43  0.43  0.01 0.23  0.00  0.15 0.15  0.00  0.01 0.00  0.02
Crit Moves:       ****        ****             ****                         ****
********************************************************************************
```

```
--------------------------------------------------------------------------------
                           Rowland Heights Plaza
              Existing Plus Project Plus Cumulative Projects
                         Weekday Evening Peak Hour
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.723
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  C
********************************************************************************
Street Name:                Fullerton Road              SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Protected        Split Phase       Split Phase
Rights:          Include           Ignore            Ignore           Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        0  0  1  1  0    1  0  2  0  1    1  1  0  0  1    2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1259     36    44  834   265   201   17   538    31    0    57
Growth Adj:  1.00 1.00   1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1259     36    44  834   265   201   17   538    31    0    57
Added Vol:     0   71     15     8   62     0    78    4     1    11    0     9
PasserByVol:   0    0      0     0    0     0     0    0     0     0    0     0
Initial Fut:   0 1330     51    52  896   265   279   21   539    42    0    66
User Adj:    1.00 1.00   1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96   0.96  0.96 0.96  0.00  0.96 0.96  0.00  0.96 0.96  0.96
PHF Volume:    0 1383     53    54  931     0   290   22     0    44    0    69
Reduct Vol:    0    0      0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0 1383     53    54  931     0   290   22     0    44    0    69
PCE Adj:     1.00 1.00   1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00   1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
FinalVolume:   0 1383     53    54  931     0   290   22     0    44    0    69
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600   1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00   1.00  1.00 1.00  1.00  1.00 1.00  1.00  0.90 1.00  1.00
Lanes:       0.00 1.93   0.07  1.00 2.00  1.00  1.86 0.14  1.00  2.00 0.00  1.00
Final Sat.:    0 3082    118  1600 3200  1600  2976  224  1600  2880    0  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.45   0.45  0.03 0.29  0.00  0.10 0.10  0.00  0.02 0.00  0.04
Crit Moves:       ****         ****                    ****                  ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                           Rowland Heights Plaza
              Existing Plus Project Plus Cumulative Projects
                             Saturday Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.931
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       100              Level Of Service:                  E
********************************************************************************
Street Name:              Fullerton Road                SR-60 Freeway EB Ramps
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|-----------------||-----------------||-----------------||-----------------|
Control:        Permitted         Protected        Split Phase       Split Phase
Rights:          Include            Ignore            Ignore            Include
Min. Green:    0    0     0     0    0     0     0    0     0     0    0     0
Lanes:       0  0  1  1  0    1  0  2  0  1    1  1  0  0  1    2  0  0  0  1
------------|-----------------||-----------------||-----------------||-----------------|
Volume Module:
Base Vol:      0 1413    81   121  917   373   255   66   567    60    0   131
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1413    81   121  917   373   255   66   567    60    0   131
Added Vol:     0   89    19    10   82     0    99    5     1    17    0    14
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0 1502   100   131  999   373   354   71   568    77    0   145
User Adj:    1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
PHF Adj:     0.97 0.97  0.97  0.97 0.97  0.00  0.97 0.97  0.00  0.97 0.97  0.97
PHF Volume:    0 1548   103   135 1030     0   365   73     0    79    0   149
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0 1548   103   135 1030     0   365   73     0    79    0   149
PCE Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
FinalVolume:   0 1548   103   135 1030     0   365   73     0    79    0   149
------------|-----------------||-----------------||-----------------||-----------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  0.90 1.00  1.00
Lanes:       0.00 1.88  0.12  1.00 2.00  1.00  1.67 0.33  1.00  2.00 0.00  1.00
Final Sat.:    0 3000   200  1600 3200  1600  2665  535  1600  2880    0  1600
------------|-----------------||-----------------||-----------------||-----------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.52  0.52  0.08 0.32  0.00  0.14 0.14  0.00  0.03 0.00  0.09
Crit Moves:       ****        ****                   ****                    ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                           Rowland Heights Plaza
                 Existing Plus Project Plus Cumulative Projects
                  Weekday Morning Peak Hour - With Improvements
--------------------------------------------------------------------------------

                     Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.569
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100              Level Of Service:                  A
********************************************************************************
Street Name:             Fullerton Road               SR-60 Freeway EB Ramps
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Protected       Split Phase      Split Phase
Rights:          Include          Ignore           Ignore           Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        0  0  2  1  0   1  0  2  0  1   1  1  0  0  1   2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1278    15    12  684   217   410   10   552     5    0    18
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1278    15    12  684   217   410   10   552     5    0    18
Added Vol:     0   50    13     7   37     0    59    4     1    10    0     8
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0 1328    28    19  721   217   469   14   553    15    0    26
User Adj:    1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
PHF Adj:     0.98 0.98  0.98  0.98 0.98  0.00  0.98 0.98  0.00  0.98 0.98  0.98
PHF Volume:    0 1350    28    19  733     0   477   14     0    15    0    26
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0 1350    28    19  733     0   477   14     0    15    0    26
PCE Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
FinalVolume:   0 1350    28    19  733     0   477   14     0    15    0    26
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  0.90 1.00  1.00
Lanes:       0.00 2.94  0.06  1.00 2.00  1.00  1.94 0.06  1.00  2.00 0.00  1.00
Final Sat.:    0 4701    99  1600 3200  1600  3107   93  1600  2880    0  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.29  0.29  0.01 0.23  0.00  0.15 0.15  0.00  0.01 0.00  0.02
Crit Moves:       ****        ****             ****                         ****
********************************************************************************
```

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Evening Peak Hour - With Improvements

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3

Cycle (sec):	100	Critical Vol./Cap.(X):	0.573
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Fullerton Road						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Ignore			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	2 1	0	1 0	2 0	1	1 1	0 0	1	2 0	0 0	1
Volume Module:												
Base Vol:	0	1259	36	44	834	265	201	17	538	31	0	57
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1259	36	44	834	265	201	17	538	31	0	57
Added Vol:	0	71	15	8	62	0	78	4	1	11	0	9
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1330	51	52	896	265	279	21	539	42	0	66
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.00	0.96	0.96	0.00	0.96	0.96	0.96
PHF Volume:	0	1383	53	54	931	0	290	22	0	44	0	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1383	53	54	931	0	290	22	0	44	0	69
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	0	1383	53	54	931	0	290	22	0	44	0	69
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00
Lanes:	0.00	2.89	0.11	1.00	2.00	1.00	1.86	0.14	1.00	2.00	0.00	1.00
Final Sat.:	0	4623	177	1600	3200	1600	2976	224	1600	2880	0	1600
Capacity Analysis Module:												
Vol/Sat:	0.00	0.30	0.30	0.03	0.29	0.00	0.10	0.10	0.00	0.02	0.00	0.04
Crit Moves:		****		****				****				****

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Saturday Peak Hour - With Improvements

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3

Cycle (sec):	100		Critical Vol./Cap.(X):	0.759
Loss Time (sec):	10 (Y+R=0.0 sec)		Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100		Level Of Service:	C

Street Name:	Fullerton Road						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Ignore			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	2 1	0	1 0	2 0	1	1 1	0 0	1	2 0	0 0	1
Volume Module:												
Base Vol:	0	1413	81	121	917	373	255	66	567	60	0	131
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1413	81	121	917	373	255	66	567	60	0	131
Added Vol:	0	89	19	10	82	0	99	5	1	17	0	14
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1502	100	131	999	373	354	71	568	77	0	145
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.00	0.97	0.97	0.00	0.97	0.97	0.97
PHF Volume:	0	1548	103	135	1030	0	365	73	0	79	0	149
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1548	103	135	1030	0	365	73	0	79	0	149
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	0	1548	103	135	1030	0	365	73	0	79	0	149
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00
Lanes:	0.00	2.81	0.19	1.00	2.00	1.00	1.67	0.33	1.00	2.00	0.00	1.00
Final Sat.:	0	4500	300	1600	3200	1600	2665	535	1600	2880	0	1600
Capacity Analysis Module:												
Vol/Sat:	0.00	0.34	0.34	0.08	0.32	0.00	0.14	0.14	0.00	0.03	0.00	0.09
Crit Moves:		****		****				****				****

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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
             Existing Plus Project Plus Cumulative Projects
                        Weekday Morning Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
     ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #4 Fullerton Road (NS) at Colima Road (EW)
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.796
Loss Time (sec):      10 (Y+R=0.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100                Level Of Service:                  C
********************************************************************************
Street Name:              Fullerton Road                   Colima Road
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:         Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        2  0  1  1  0    2  0  1  1  0    2  0  2  1  0    2  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     291  771    68   198  841   151    95  368   144   179  739   264
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  291  771    68   198  841   151    95  368   144   179  739   264
Added Vol:      0   36     3     7   26    14    19    5     0     2    4     9
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  291  807    71   205  867   165   114  373   144   181  743   273
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:   300  832    73   211  894   170   118  385   148   187  766   281
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  300  832    73   211  894   170   118  385   148   187  766   281
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  300  832    73   211  894   170   118  385   148   187  766   281
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  0.90 1.00  1.00  0.90 1.00  1.00  0.90 1.00  1.00  0.90 1.00  1.00
Lanes:       2.00 1.84  0.16  2.00 1.68  0.32  2.00 2.16  0.84  2.00 2.19  0.81
Final Sat.:  2880 2941   259  2880 2688   512  2880 3463  1337  2880 3510  1290
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.28  0.28  0.07 0.33  0.33  0.04 0.11  0.11  0.06 0.22  0.22
Crit Moves:  ****                  ****        ****                   ****
********************************************************************************
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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
            Existing Plus Project Plus Cumulative Projects
                       Weekday Evening Peak Hour
--------------------------------------------------------------------------------

                   Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #4 Fullerton Road (NS) at Colima Road (EW)
********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):         0.847
Loss Time (sec):       10 (Y+R=0.0 sec)   Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100                 Level Of Service:                  D
********************************************************************************
Street Name:               Fullerton Road                  Colima Road
Approach:         North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:          Protected        Protected        Protected        Protected
Rights:            Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:          2  0  1  1  0    2  0  1  1  0    2  0  2  1  0    2  0  2  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:     267   706    85   400   755   151   172  1029   144   209   720   213
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:  267   706    85   400   755   151   172  1029   144   209   720   213
Added Vol:      0    49     3     8    43    23    26     6     0     3     5    10
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:  267   755    88   408   798   174   198  1035   144   212   725   223
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97
PHF Volume:   275   778    91   421   823   179   204  1067   148   219   747   230
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:  275   778    91   421   823   179   204  1067   148   219   747   230
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:  275   778    91   421   823   179   204  1067   148   219   747   230
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:  0.90  1.00  1.00  0.90  1.00  1.00  0.90  1.00  1.00  0.90  1.00  1.00
Lanes:       2.00  1.79  0.21  2.00  1.64  0.36  2.00  2.63  0.37  2.00  2.29  0.71
Final Sat.:  2880  2866   334  2880  2627   573  2880  4214   586  2880  3671  1129
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.10  0.27  0.27  0.15  0.31  0.31  0.07  0.25  0.25  0.08  0.20  0.20
Crit Moves:        ****        ****                    ****        ****
********************************************************************************
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-------------------------------------------------------------------------------
                            Rowland Heights Plaza
                Existing Plus Project Plus Cumulative Projects
                              Saturday Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*******************************************************************************
Intersection #4 Fullerton Road (NS) at Colima Road (EW)
*******************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.885
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100                Level Of Service:                  D
*******************************************************************************
Street Name:            Fullerton Road                      Colima Road
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:         Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        2  0  1  1  0   2  0  1  1  0   2  0  2  1  0   2  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     280  532   101   397  610   263   263  951   162   220  972   312
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  280  532   101   397  610   263   263  951   162   220  972   312
Added Vol:      0   62     4    12   58    30    33    8     0     4    7    13
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  280  594   105   409  668   293   296  959   162   224  979   325
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98
PHF Volume:   285  604   107   416  680   298   301  976   165   228  996   331
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  285  604   107   416  680   298   301  976   165   228  996   331
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  285  604   107   416  680   298   301  976   165   228  996   331
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  0.90 1.00  1.00  0.90 1.00  1.00  0.90 1.00  1.00  0.90 1.00  1.00
Lanes:       2.00 1.70  0.30  2.00 1.39  0.61  2.00 2.57  0.43  2.00 2.25  0.75
Final Sat.:  2880 2719   481  2880 2224   976  2880 4106   694  2880 3604  1196
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.22  0.22  0.14 0.31  0.31  0.10 0.24  0.24  0.08 0.28  0.28
Crit Moves:  ****                  ****        ****                  ****
*******************************************************************************
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-------------------------------------------------------------------------------
                            Rowland Heights Plaza
                 Existing Plus Project Plus Cumulative Projects
                          Weekday Morning Peak Hour
-------------------------------------------------------------------------------

                      Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*******************************************************************************
Intersection #5 Coiner Court (NS) at Gale Avenue (EW) - #5
*******************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):          0.368
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:       100              Level Of Service:                   A
*******************************************************************************
Street Name:              Coiner Court                      Gale Avenue
Approach:        North Bound      South Bound       East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted         Permitted         Permitted         Permitted
Rights:           Include           Include           Include           Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        0  0  0  0  0    1  0  0  0  1    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0     0     0   12     0     4   46   158     0    0   500    64
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:    0     0     0   12     0     4   46   158     0    0   500    64
Added Vol:      0     0     0    0     0     0    0   126     0    0    92     0
PasserByVol:    0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:    0     0     0   12     0     4   46   284     0    0   592    64
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90
PHF Volume:     0     0     0   13     0     4   51   316     0    0   659    71
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:    0     0     0   13     0     4   51   316     0    0   659    71
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:    0     0     0   13     0     4   51   316     0    0   659    71
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       0.00  0.00  0.00 1.00  0.00  1.00 1.00  2.00  0.00 0.00  1.80  0.20
Final Sat.:     0     0     0 1600     0  1600 1600  3200     0    0  2888   312
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00 0.01  0.00  0.00 0.03  0.10  0.00 0.00  0.23  0.23
Crit Moves:                   ****             ****                   ****
*******************************************************************************
```

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #5 Coiner Court (NS) at Gale Avenue (EW) - #5

Cycle (sec):	100	Critical Vol./Cap.(X):	0.488
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Coiner Court						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0	0 0	1 0	0	0 1	1 0	2	0 0	0 0	1	1 0
Volume Module:												
Base Vol:	0	0	0	117	0	47	13	693	0	0	390	22
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	117	0	47	13	693	0	0	390	22
Added Vol:	0	0	0	0	0	0	0	171	0	0	154	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	117	0	47	13	864	0	0	544	22
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	0	0	0	132	0	53	15	976	0	0	615	25
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	132	0	53	15	976	0	0	615	25
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	132	0	53	15	976	0	0	615	25
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	1.92	0.08
Final Sat.:	0	0	0	1600	0	1600	1600	3200	0	0	3076	124
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.08	0.00	0.03	0.01	0.31	0.00	0.00	0.20	0.20
Crit Moves:				****				****		****		

```
------------------------------------------------------------------------------
                          Rowland Heights Plaza
             Existing Plus Project Plus Cumulative Projects
                           Saturday Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
******************************************************************************
Intersection #5 Coiner Court (NS) at Gale Avenue (EW) - #5
******************************************************************************
Cycle (sec):         100             Critical Vol./Cap.(X):          0.401
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100             Level Of Service:                   A
******************************************************************************
Street Name:             Coiner Court                     Gale Avenue
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       0  0  0  0  0   1  0  0  0  1   1  0  2  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0     0     0   17     0    18   17   655     0    0   482    14
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0     0     0   17     0    18   17   655     0    0   482    14
Added Vol:     0     0     0    0     0     0    0   216     0    0   202     0
PasserByVol:   0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:   0     0     0   17     0    18   17   871     0    0   684    14
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94
PHF Volume:    0     0     0   18     0    19   18   927     0    0   728    15
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   0     0     0   18     0    19   18   927     0    0   728    15
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   0     0     0   18     0    19   18   927     0    0   728    15
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600  1600
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 1.00 0.00  1.00 1.00 2.00  0.00 0.00 1.96  0.04
Final Sat.:    0     0     0 1600     0  1600 1600 3200     0    0 3136    64
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.01 0.00  0.01 0.01 0.29  0.00 0.00 0.23  0.23
Crit Moves:                  ****                  ****        ****
******************************************************************************
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```
                         Rowland Heights Plaza
             Existing Plus Project Plus Cumulative Projects
              Weekday Morning Peak Hour - With Improvements
-------------------------------------------------------------------------------

                   Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*******************************************************************************
Intersection #6 Project West Access (NS) at Gale Avenue (EW) - #6
*******************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.380
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100              Level Of Service:                  A
*******************************************************************************
Street Name:        Project West Access                  Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        0  0  0  0  0   0  0  1! 0  0   1  0  2  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0    0    0    0    0    0  163    0    0  598    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:    0    0    0    0    0    0    0  163    0    0  598    0
Added Vol:      0    0    0   27    0   13   17  114    0    0   84   55
PasserByVol:    0    0    0    0    0    0    0    0    0    0    0    0
Initial Fut:    0    0    0   27    0   13   17  277    0    0  682   55
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume:     0    0    0   28    0   14   18  292    0    0  718   58
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:    0    0    0   28    0   14   18  292    0    0  718   58
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:    0    0    0   28    0   14   18  292    0    0  718   58
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       0.00 0.00 0.00 0.67 0.00 0.33 1.00 2.00 0.00 0.00 1.85 0.15
Final Sat.:     0    0    0 1080    0  520 1600 3200    0    0 2961  239
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.00 0.02 0.00 0.03 0.01 0.09 0.00 0.00 0.24 0.24
Crit Moves:                            **** ****                 ****
*******************************************************************************
```

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Evening Peak Hour - With Improvements

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #6 Project West Access (NS) at Gale Avenue (EW) - #6

Cycle (sec):	100	Critical Vol./Cap.(X):	0.454
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Project West Access						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		0 0 0 0 0			0 0 1! 0 0			1 0 2 0 0			0 0 1 1 0	
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	806	0	0	415	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	806	0	0	415	0
Added Vol:	0	0	0	34	0	22	25	159	0	0	142	58
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	34	0	22	25	965	0	0	557	58
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	36	0	23	26	1016	0	0	586	61
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	36	0	23	26	1016	0	0	586	61
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	36	0	23	26	1016	0	0	586	61
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.61	0.00	0.39	1.00	2.00	0.00	0.00	1.81	0.19
Final Sat.:	0	0	0	971	0	629	1600	3200	0	0	2898	302
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.02	0.00	0.04	0.02	0.32	0.00	0.00	0.20	0.20
Crit Moves:						****		****		****		

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--------------------------------------------------------------------------------
                            Rowland Heights Plaza
                 Existing Plus Project Plus Cumulative Projects
                     Saturday Peak Hour - With Improvements
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #6 Project West Access (NS) at Gale Avenue (EW) - #6
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):        0.433
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       100              Level Of Service:                 A
********************************************************************************
Street Name:          Project West Access                 Gale Avenue
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted         Permitted         Permitted         Permitted
Rights:          Include           Include           Include           Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0     0     0     0     0     0     0   672     0     0   517     0
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:    0     0     0     0     0     0     0   672     0     0   517     0
Added Vol:      0     0     0    41     0    29    32   201     0     0   187    74
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:    0     0     0    41     0    29    32   873     0     0   704    74
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95
PHF Volume:     0     0     0    43     0    31    34   919     0     0   741    78
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:    0     0     0    43     0    31    34   919     0     0   741    78
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:    0     0     0    43     0    31    34   919     0     0   741    78
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       0.00  0.00  0.00  0.58  0.01  0.41  1.00  2.00  0.00  0.00  1.81  0.19
Final Sat.:     0     0     0   937     0   663  1600  3200     0     0  2896   304
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00  0.03  0.00  0.05  0.02  0.29  0.00  0.00  0.26  0.26
Crit Moves:                               ****        ****        ****
********************************************************************************
```

```
--------------------------------------------------------------------------------
                              Rowland Heights Plaza
                 Existing Plus Project Plus Cumulative Projects
                           Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                       Level Of Service Computation Report
     ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.452
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100                Level Of Service:                  A
********************************************************************************
Street Name:      Project Central Access                  Gale Avenue
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Permitted        Permitted        Permitted        Permitted
Rights:         Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  1  0  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      3     0     8    0     0     0    0   159     4    4   595     0
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   3     0     8    0     0     0    0   159     4    4   595     0
Added Vol:     0     0     0   33     0    59   55    86     0    0    79    71
PasserByVol:   0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:   3     0     8   33     0    59   55   245     4    4   674    71
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93
PHF Volume:    3     0     9   36     0    64   59   264     4    4   726    76
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   3     0     9   36     0    64   59   264     4    4   726    76
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:   3     0     9   36     0    64   59   264     4    4   726    76
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600  1600
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       0.27  0.00  0.73 0.36  0.00  0.64 0.36  1.61  0.03 1.00  1.81  0.19
Final Sat.:   436     0  1164  574     0  1026  579  2579    42 1600  2895   305
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.01 0.02  0.00  0.06 0.04  0.10  0.10 0.00  0.25  0.25
Crit Moves:  ****                         **** ****                     ****
********************************************************************************
```

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-------------------------------------------------------------------------------
                         Rowland Heights Plaza
               Existing Plus Project Plus Cumulative Projects
                        Weekday Evening Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*******************************************************************************
Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7
*******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):        0.532
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  A
*******************************************************************************
Street Name:      Project Central Access                 Gale Avenue
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:          0  0  1! 0  0   0  0  1! 0  0   0  1  0  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       7    0    6     0    0    0     0  800    1     3  412    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    7    0    6     0    0    0     0  800    1     3  412    0
Added Vol:      0    0    0    48    0   87    58  136    0     0  112   92
PasserByVol:    0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:    7    0    6    48    0   87    58  936    1     3  524   92
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93
PHF Volume:     8    0    6    52    0   94    62 1008    1     3  564   99
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    8    0    6    52    0   94    62 1008    1     3  564   99
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:    8    0    6    52    0   94    62 1008    1     3  564   99
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       0.54 0.00 0.46  0.36 0.00 0.64  0.11 1.88 0.01  1.00 1.70 0.30
Final Sat.:   862    0  738   569    0 1031   187 3010    3  1600 2722  478
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.01  0.03 0.00 0.09  0.04 0.33 0.33  0.00 0.21 0.21
Crit Moves:  ****                      ****        ****        ****
*******************************************************************************
```

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7

Cycle (sec):	100	Critical Vol./Cap.(X):	0.519
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Project Central Access						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 1! 0 0			0 0 1! 0 0			0 1 0 1 0			1 0 1 1 0		
Volume Module:												
Base Vol:	4	0	5	0	0	0	0	665	3	9	508	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	0	5	0	0	0	0	665	3	9	508	0
Added Vol:	0	0	0	60	0	110	74	168	0	0	150	116
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	4	0	5	60	0	110	74	833	3	9	658	116
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	4	0	5	63	0	116	78	876	3	9	692	122
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	4	0	5	63	0	116	78	876	3	9	692	122
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	4	0	5	63	0	116	78	876	3	9	692	122
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.44	0.00	0.56	0.35	0.00	0.65	0.16	1.83	0.01	1.00	1.70	0.30
Final Sat.:	711	0	889	565	0	1035	260	2929	11	1600	2720	480
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.01	0.04	0.00	0.11	0.05	0.30	0.30	0.01	0.25	0.25
Crit Moves:	****					****		****		****		

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---------------------------------------------------------------------------------
                              Rowland Heights Plaza
                 Existing Plus Project Plus Cumulative Projects
                  Weekday Morning Peak Hour - With Improvements
---------------------------------------------------------------------------------

                       Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*********************************************************************************
Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7
*********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):          0.452
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100                Level Of Service:                   A
*********************************************************************************
Street Name:       Project Central Access                     Gale Avenue
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Permitted         Permitted         Permitted         Permitted
Rights:           Include           Include           Include           Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  1! 0  0   0  0  1! 0  0   1  0  1  1  0   1  0  1  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      3    0     8    0    0     0    0  159     4    4  595     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   3    0     8    0    0     0    0  159     4    4  595     0
Added Vol:     0    0     0   33    0    59   55   86     0    0   79    71
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   3    0     8   33    0    59   55  245     4    4  674    71
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93
PHF Volume:    3    0     9   36    0    64   59  264     4    4  726    76
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   3    0     9   36    0    64   59  264     4    4  726    76
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   3    0     9   36    0    64   59  264     4    4  726    76
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600  1600
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.27 0.00  0.73 0.36 0.00  0.64 1.00 1.97  0.03 1.00 1.81  0.19
Final Sat.:   436    0  1164  574    0  1026 1600 3149    51 1600 2895   305
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.01 0.02 0.00  0.06 0.04 0.08  0.08 0.00 0.25  0.25
Crit Moves:  ****                       **** ****                     ****
*********************************************************************************
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--------------------------------------------------------------------------------
                              Rowland Heights Plaza
                 Existing Plus Project Plus Cumulative Projects
                  Weekday Evening Peak Hour - With Improvements
--------------------------------------------------------------------------------

                       Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):          0.513
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100              Level Of Service:                   A
********************************************************************************
Street Name:       Project Central Access                Gale Avenue
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Permitted        Permitted         Permitted        Permitted
Rights:         Include          Include           Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        0  0  1! 0  0   0  0  1! 0  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       7    0    6    0    0    0    0  800    1    3  412    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:    7    0    6    0    0    0    0  800    1    3  412    0
Added Vol:      0    0    0   48    0   87   58  136    0    0  112   92
PasserByVol:    0    0    0    0    0    0    0    0    0    0    0    0
Initial Fut:    7    0    6   48    0   87   58  936    1    3  524   92
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume:     8    0    6   52    0   94   62 1008    1    3  564   99
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:    8    0    6   52    0   94   62 1008    1    3  564   99
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:    8    0    6   52    0   94   62 1008    1    3  564   99
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       0.54 0.00 0.46 0.36 0.00 0.64 1.00 1.99 0.01 1.00 1.70 0.30
Final Sat.:   862    0  738  569    0 1031 1600 3197    3 1600 2722  478
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.01 0.03 0.00 0.09 0.04 0.32 0.32 0.00 0.21 0.21
Crit Moves:  ****                     ****      ****      ****
********************************************************************************
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Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Saturday Peak Hour - With Improvements

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #7 Project Central Access (NS) at Gale Avenue (EW) - #7

Cycle (sec):	100	Critical Vol./Cap.(X):	0.517
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Project Central Access						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	1!	0 0	0 0	1!	0 0	1 0	1	1 0	1 0	1	1 0
Volume Module:												
Base Vol:	4	0	5	0	0	0	0	665	3	9	508	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	0	5	0	0	0	0	665	3	9	508	0
Added Vol:	0	0	0	60	0	110	74	168	0	0	150	116
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	4	0	5	60	0	110	74	833	3	9	658	116
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	4	0	5	63	0	116	78	876	3	9	692	122
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	4	0	5	63	0	116	78	876	3	9	692	122
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	4	0	5	63	0	116	78	876	3	9	692	122
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.44	0.00	0.56	0.35	0.00	0.65	1.00	1.99	0.01	1.00	1.70	0.30
Final Sat.:	711	0	889	565	0	1035	1600	3189	11	1600	2720	480
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.01	0.04	0.00	0.11	0.05	0.27	0.27	0.01	0.25	0.25
Crit Moves:	****					****	****				****	

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--------------------------------------------------------------------------------
                            Rowland Heights Plaza
             Existing Plus Project Plus Cumulative Projects
                          Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #8 Project East Access (NS) at Gale Avenue (EW) - #8
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.492
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100                Level Of Service:                  A
********************************************************************************
Street Name:       Project East Access                     Gale Avenue
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted         Permitted         Permitted         Permitted
Rights:          Include           Include           Include           Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  1! 0  0    0  1  0  0  1    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      1     0     1   11     0     2   16   167     0    0   599     3
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   1     0     1   11     0     2   16   167     0    0   599     3
Added Vol:     0     0     0  101     0    25   59    60     0    0   125    92
PasserByVol:   0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:   1     0     1  112     0    27   75   227     0    0   724    95
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:    1     0     1  118     0    28   79   239     0    0   762   100
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   1     0     1  118     0    28   79   239     0    0   762   100
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   1     0     1  118     0    28   79   239     0    0   762   100
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600  1600
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.50 0.00  0.50 1.00 0.00  1.00 1.00 2.00  0.00 1.00 1.77  0.23
Final Sat.:   800    0   800 1600    0  1600 1600 3200     0 1600 2829   371
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.07 0.00  0.02 0.05 0.07  0.00 0.00 0.27  0.27
Crit Moves:       ****       ****              ****                  ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
            Existing Plus Project Plus Cumulative Projects
                        Weekday Evening Peak Hour
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #8 Project East Access (NS) at Gale Avenue (EW) - #8
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.662
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  B
********************************************************************************
Street Name:      Project East Access                      Gale Avenue
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Permitted        Permitted         Permitted        Permitted
Rights:         Include          Include           Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       0  0  1! 0  0   0  1  0  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      1     0     1    72     0    74   105   800     0     0   419    21
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   1     0     1    72     0    74   105   800     0     0   419    21
Added Vol:     0     0     0   197     0    54   101    82     0     0   149   169
PasserByVol:   0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   1     0     1   269     0   128   206   882     0     0   568   190
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95  0.95
PHF Volume:    1     0     1   283     0   135   217   928     0     0   598   200
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   1     0     1   283     0   135   217   928     0     0   598   200
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:   1     0     1   283     0   135   217   928     0     0   598   200
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       0.50  0.00  0.50  1.00  0.00  1.00  1.00  2.00  0.00  1.00  1.50  0.50
Final Sat.:   800     0   800  1600     0  1600  1600  3200     0  1600  2398   802
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00  0.18  0.00  0.08  0.14  0.29  0.00  0.00  0.25  0.25
Crit Moves:        ****        ****              ****                    ****
********************************************************************************
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Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #8 Project East Access (NS) at Gale Avenue (EW) - #8

Cycle (sec):	100	Critical Vol./Cap.(X):	0.824
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	D

Street Name:	Project East Access						Gale Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 1! 0 0			0 1 0 0 1			1 0 1 1 0			1 0 1 1 0		
Volume Module:												
Base Vol:	1	0	1	93	0	96	136	672	0	0	517	27
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	0	1	93	0	96	136	672	0	0	517	27
Added Vol:	0	0	0	271	0	77	127	101	0	0	190	212
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1	0	1	364	0	173	263	773	0	0	707	239
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	1	0	1	383	0	182	277	814	0	0	744	252
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1	0	1	383	0	182	277	814	0	0	744	252
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1	0	1	383	0	182	277	814	0	0	744	252
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.50	0.00	0.50	1.00	0.00	1.00	1.00	2.00	0.00	1.00	1.49	0.51
Final Sat.:	800	0	800	1600	0	1600	1600	3200	0	1600	2392	808
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.24	0.00	0.11	0.17	0.25	0.00	0.00	0.31	0.31
Crit Moves:		****		****			****				****	

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--------------------------------------------------------------------------------
                           Rowland Heights Plaza
             Existing Plus Project Plus Cumulative Projects
                        Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                  Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #9 Nogales Street (NS) at Shadow Oak Drive (EW) - #9
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap.(X):        0.702
Loss Time (sec):     10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:      100               Level Of Service:                 C
********************************************************************************
Street Name:            Nogales Street                  Shadow Oak Drive
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected         Permitted        Permitted
Rights:          Include          Include           Include          Include
Min. Green:    0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        1  0  2  0  1   1  0  2  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:    134  741   126    45  681    28    52  101   194   188   97    96
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse: 134  741   126    45  681    28    52  101   194   188   97    96
Added Vol:    12   12    12     0   17     0     0    0    17    17    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut: 146  753   138    45  698    28    52  101   211   205   97    96
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:  154  796   146    48  738    30    55  107   223   217  103   101
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 154  796   146    48  738    30    55  107   223   217  103   101
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume: 154  796   146    48  738    30    55  107   223   217  103   101
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:      1.00 2.00  1.00  1.00 2.00  1.00  1.00 1.00  1.00  1.00 1.01  0.99
Final Sat.: 1600 3200  1600  1600 3200  1600  1600 1600  1600  1600 1608  1592
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.10 0.25  0.09  0.03 0.23  0.02  0.03 0.07  0.14  0.14 0.06  0.06
Crit Moves: ****                  ****                    ****  ****
********************************************************************************
```

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---------------------------------------------------------------------------------
                              Rowland Heights Plaza
                 Existing Plus Project Plus Cumulative Projects
                            Weekday Evening Peak Hour
---------------------------------------------------------------------------------

                         Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*********************************************************************************
Intersection #9 Nogales Street (NS) at Shadow Oak Drive (EW) - #9
*********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):          0.569
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100                Level Of Service:                   A
*********************************************************************************
Street Name:               Nogales Street                   Shadow Oak Drive
Approach:        North Bound       South Bound       East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|-----------------||----------------||----------------||-------------|
Control:        Protected        Protected          Permitted         Permitted
Rights:           Include          Include           Include           Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         1  0  2  0  1    1  0  2  0  1    1  0  1  1  0    1  0  1  1  0
------------|-----------------||----------------||----------------||-------------|
Volume Module:
Base Vol:     134   814   138    41   662    51    38    61   102    77    45    31
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:  134   814   138    41   662    51    38    61   102    77    45    31
Added Vol:     21    21    21     0    23     0     0     0    23    23     0     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:  155   835   159    41   685    51    38    61   125   100    45    31
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.96  0.96  0.96  0.96  0.96  0.96  0.96  0.96  0.96  0.96  0.96  0.96
PHF Volume:   161   868   165    43   712    53    40    63   130   104    47    32
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:  161   868   165    43   712    53    40    63   130   104    47    32
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:  161   868   165    43   712    53    40    63   130   104    47    32
------------|-----------------||----------------||----------------||-------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       1.00  2.00  1.00  1.00  2.00  1.00  1.00  1.00  1.00  1.00  1.18  0.82
Final Sat.:  1600  3200  1600  1600  3200  1600  1600  1600  1600  1600  1895  1305
------------|-----------------||----------------||----------------||-------------|
Capacity Analysis Module:
Vol/Sat:     0.10  0.27  0.10  0.03  0.22  0.03  0.02  0.04  0.08  0.06  0.02  0.02
Crit Moves:  ****                    ****                    ****  ****
*********************************************************************************
```

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #9 Nogales Street (NS) at Shadow Oak Drive (EW) - #9

Cycle (sec): 100	Critical Vol./Cap.(X):	0.585
Loss Time (sec): 10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle: 100	Level Of Service:	A

Street Name:	Nogales Street						Shadow Oak Drive					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2 0	1	1 0	2 0	1	1 0	1 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	106	703	91	18	664	38	37	23	136	86	20	30
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	106	703	91	18	664	38	37	23	136	86	20	30
Added Vol:	27	27	27	0	29	0	0	0	29	29	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	133	730	118	18	693	38	37	23	165	115	20	30
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	136	746	121	18	709	39	38	24	169	118	20	31
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	136	746	121	18	709	39	38	24	169	118	20	31
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	136	746	121	18	709	39	38	24	169	118	20	31
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1600	3200	1600	1600	3200	1600	1600	1600	1600	1600	1600	1600
Capacity Analysis Module:												
Vol/Sat:	0.08	0.23	0.08	0.01	0.22	0.02	0.02	0.01	0.11	0.07	0.01	0.02
Crit Moves:	****				****				****	****		

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-------------------------------------------------------------------------------
                         Rowland Heights Plaza
            Existing Plus Project Plus Cumulative Projects
                       Weekday Morning Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*******************************************************************************
Intersection #10 Nogales Street (NS) at La Puente Road (EW) - #10
*******************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):          0.848
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100              Level Of Service:                   D
*******************************************************************************
Street Name:             Nogales Street                   La Puente Road
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected       Split Phase      Split Phase
Rights:         Include          Include          Include          Include
Min. Green:   0    0    0     0    0    0     0    0    0     0    0    0
Lanes:       1  0  2  0  1   1  0  2  0  1   0  0  1! 0  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     32  632   147   126  991   118    91   41    36   280   39   163
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  32  632   147   126  991   118    91   41    36   280   39   163
Added Vol:     0   37    12     0   50     0     0    0     0    17    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  32  669   159   126 1041   118    91   41    36   297   39   163
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88
PHF Volume:   36  758   180   143 1179   134   103   46    41   336   44   185
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  36  758   180   143 1179   134   103   46    41   336   44   185
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  36  758   180   143 1179   134   103   46    41   336   44   185
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:      1.00 2.00  1.00  1.00 2.00  1.00  0.55 0.24  0.21  0.88 0.12  1.00
Final Sat.: 1600 3200  1600  1600 3200  1600   867  390   343  1414  186  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.02 0.24  0.11  0.09 0.37  0.08  0.12 0.12  0.12  0.24 0.24  0.12
Crit Moves: ****                  ****             ****             ****
*******************************************************************************
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-----------------------------------------------------------------------------
                       Rowland Heights Plaza
              Existing Plus Project Plus Cumulative Projects
                         Weekday Evening Peak Hour
-----------------------------------------------------------------------------

                    Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*****************************************************************************
Intersection #10 Nogales Street (NS) at La Puente Road (EW) - #10
*****************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.808
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100                Level Of Service:                 D
*****************************************************************************
Street Name:              Nogales Street                 La Puente Road
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0   0     0     0   0     0     0   0     0     0
Lanes:         1  0  2  0  1   1  0  2  0  1   0  0  1! 0  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        2   966   391   206   597    45    69    33    17   225    20   158
Growth Adj:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:     2   966   391   206   597    45    69    33    17   225    20   158
Added Vol:       0    62    21     0    70     0     0     0     0    23     0     0
PasserByVol:     0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:     2  1028   412   206   667    45    69    33    17   248    20   158
User Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:      0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98
PHF Volume:      2  1052   422   211   683    46    71    34    17   254    20   162
Reduct Vol:      0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:     2  1052   422   211   683    46    71    34    17   254    20   162
PCE Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:     2  1052   422   211   683    46    71    34    17   254    20   162
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:        1.00  2.00  1.00  1.00  2.00  1.00  0.58  0.28  0.14  0.93  0.07  1.00
Final Sat.:   1600  3200  1600  1600  3200  1600   928   444   229  1481   119  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.00  0.33  0.26  0.13  0.21  0.03  0.08  0.08  0.08  0.17  0.17  0.10
Crit Moves:         ****        ****                              ****        ****
*****************************************************************************
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Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #10 Nogales Street (NS) at La Puente Road (EW) - #10

Cycle (sec):	100	Critical Vol./Cap.(X):	0.819
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	D

Street Name:		Nogales Street						La Puente Road				
Approach:		North Bound			South Bound			East Bound			West Bound	
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Split Phase			Split Phase	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		1 0 2 0 1			1 0 2 0 1			0 0 1! 0 0			0 1 0 0 1	
Volume Module:												
Base Vol:	8	760	246	191	767	1	26	14	34	390	1	158
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	8	760	246	191	767	1	26	14	34	390	1	158
Added Vol:	0	82	27	0	88	0	0	0	0	29	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	8	842	273	191	855	1	26	14	34	419	1	158
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	8	876	284	199	890	1	27	15	35	436	1	164
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	876	284	199	890	1	27	15	35	436	1	164
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	8	876	284	199	890	1	27	15	35	436	1	164
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	0.35	0.19	0.46	0.99	0.01	1.00
Final Sat.:	1600	3200	1600	1600	3200	1600	562	303	735	1596	4	1600
Capacity Analysis Module:												
Vol/Sat:	0.01	0.27	0.18	0.12	0.28	0.00	0.05	0.05	0.05	0.27	0.27	0.10
Crit Moves:		****		****					****		****	

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                          Rowland Heights Plaza
              Existing Plus Project Plus Cumulative Projects
                        Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                   Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #11 Nogales Street  (NS) at Valley Boulevard Loop (EW) - #11
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.654
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100              Level Of Service:                  B
********************************************************************************
Street Name:              Nogales Street                Valley Boulevard Loop
Approach:        North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         1  0  2  1  0    1  0  2  1  0    0  0  1! 0  0    1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      32   634   146    88  1132   156    48    18    32   180     1   222
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   32   634   146    88  1132   156    48    18    32   180     1   222
Added Vol:      0    49    18     0    66     0     0     0     0    24     0     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   32   683   164    88  1198   156    48    18    32   204     1   222
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.91  0.91  0.91  0.91  0.91  0.91  0.91  0.91  0.91  0.91  0.91  0.91
PHF Volume:    35   753   181    97  1321   172    53    20    35   225     1   245
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   35   753   181    97  1321   172    53    20    35   225     1   245
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:   35   753   181    97  1321   172    53    20    35   225     1   245
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       1.00  2.42  0.58  1.00  2.65  0.35  0.49  0.18  0.33  1.99  0.01  1.00
Final Sat.:  1600  3871   929  1600  4247   553   784   294   522  3184    16  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02  0.19  0.19  0.06  0.31  0.31  0.07  0.07  0.07  0.07  0.07  0.15
Crit Moves:  ****                    ****              ****                    ****
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Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #11 Nogales Street (NS) at Valley Boulevard Loop (EW) - #11

Cycle (sec):	100	Critical Vol./Cap.(X):	0.655
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Nogales Street						Valley Boulevard Loop					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2	1 0	1 0	2	1 0	0 0	1!	0 0	1 1	0	0 1
Volume Module:												
Base Vol:	16	1225	222	74	622	43	30	4	13	121	2	211
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	16	1225	222	74	622	43	30	4	13	121	2	211
Added Vol:	0	83	33	0	93	0	0	0	0	38	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	16	1308	255	74	715	43	30	4	13	159	2	211
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	17	1363	266	77	745	45	31	4	14	166	2	220
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	17	1363	266	77	745	45	31	4	14	166	2	220
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	17	1363	266	77	745	45	31	4	14	166	2	220
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.51	0.49	1.00	2.83	0.17	0.64	0.08	0.28	1.98	0.02	1.00
Final Sat.:	1600	4017	783	1600	4528	272	1021	136	443	3160	40	1600
Capacity Analysis Module:												
Vol/Sat:	0.01	0.34	0.34	0.05	0.16	0.16	0.03	0.03	0.03	0.05	0.05	0.14
Crit Moves:		****		****				****				****

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #11 Nogales Street (NS) at Valley Boulevard Loop (EW) - #11

Cycle (sec):	100	Critical Vol./Cap.(X):	0.566
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Nogales Street						Valley Boulevard Loop					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2	1 0	1 0	2	1 0	0 0	1!	0 0	1 1	0	0 1
Volume Module:												
Base Vol:	22	1004	122	86	1094	68	29	2	20	154	2	160
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	22	1004	122	86	1094	68	29	2	20	154	2	160
Added Vol:	0	109	44	0	118	0	0	0	0	48	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	22	1113	166	86	1212	68	29	2	20	202	2	160
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	23	1147	171	89	1249	70	30	2	21	208	2	165
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	23	1147	171	89	1249	70	30	2	21	208	2	165
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	23	1147	171	89	1249	70	30	2	21	208	2	165
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.61	0.39	1.00	2.84	0.16	0.57	0.04	0.39	1.98	0.02	1.00
Final Sat.:	1600	4177	623	1600	4545	255	910	63	627	3169	31	1600
Capacity Analysis Module:												
Vol/Sat:	0.01	0.27	0.27	0.06	0.27	0.27	0.03	0.03	0.03	0.07	0.07	0.10
Crit Moves:		****		****			****					****

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #12 Valley Boulevard Loop (NS) at Valley Boulevard (EW) - #12

Cycle (sec):	100	Critical Vol./Cap.(X):	0.581
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Valley Boulevard Loop						Valley Boulevard					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0	0 0	2 0	0	0 1	2 0	3	0 0	0 0	2	1 0
Volume Module:												
Base Vol:	0	0	0	101	0	151	181	512	0	0	996	251
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	101	0	151	181	512	0	0	996	251
Added Vol:	0	0	0	6	0	12	17	0	0	0	0	7
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	107	0	163	198	512	0	0	996	258
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	0	0	0	119	0	182	221	571	0	0	1110	288
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	119	0	182	221	571	0	0	1110	288
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	119	0	182	221	571	0	0	1110	288
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	2.00	0.00	1.00	2.00	3.00	0.00	0.00	2.38	0.62
Final Sat.:	0	0	0	2880	0	1600	2880	4800	0	0	3812	988
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.04	0.00	0.11	0.08	0.12	0.00	0.00	0.29	0.29
Crit Moves:						****	****				****	

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #12 Valley Boulevard Loop (NS) at Valley Boulevard (EW) - #12

Cycle (sec):	100	Critical Vol./Cap.(X):	0.415
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	A

Street Name:	Valley Boulevard Loop						Valley Boulevard					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0	0 0	2 0	0	0 1	2 0	3	0 0	0 0	2	1 0
Volume Module:												
Base Vol:	0	0	0	211	0	90	102	1072	0	0	643	228
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	211	0	90	102	1072	0	0	643	228
Added Vol:	0	0	0	12	0	21	23	0	0	0	0	15
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	223	0	111	125	1072	0	0	643	243
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	0	0	0	230	0	115	129	1106	0	0	664	251
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	230	0	115	129	1106	0	0	664	251
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	230	0	115	129	1106	0	0	664	251
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	2.00	0.00	1.00	2.00	3.00	0.00	0.00	2.18	0.82
Final Sat.:	0	0	0	2880	0	1600	2880	4800	0	0	3484	1316
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.08	0.00	0.07	0.04	0.23	0.00	0.00	0.19	0.19
Crit Moves:				****			****				****	

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------------------------------------------------------------------------------
                          Rowland Heights Plaza
             Existing Plus Project Plus Cumulative Projects
                           Saturday Peak Hour
------------------------------------------------------------------------------

                    Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
******************************************************************************
Intersection #12 Valley Boulevard Loop (NS) at Valley Boulevard (EW) - #12
******************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.363
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        100              Level Of Service:                  A
******************************************************************************
Street Name:       Valley Boulevard Loop                Valley Boulevard
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted         Permitted         Protected         Permitted
Rights:            Include           Include           Include           Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         0  0  0  0  0   2  0  0  0  1   2  0  3  0  0   0  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0     0     0   128     0    87    94   429     0     0   465   188
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:    0     0     0   128     0    87    94   429     0     0   465   188
Added Vol:      0     0     0    17     0    27    29     0     0     0     0    19
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:    0     0     0   145     0   114   123   429     0     0   465   207
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97
PHF Volume:     0     0     0   150     0   118   127   444     0     0   481   214
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:    0     0     0   150     0   118   127   444     0     0   481   214
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:    0     0     0   150     0   118   127   444     0     0   481   214
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:  1.00  1.00  1.00  0.90  1.00  1.00  0.90  1.00  1.00  1.00  1.00  1.00
Lanes:       0.00  0.00  0.00  2.00  0.00  1.00  2.00  3.00  0.00  0.00  2.08  0.92
Final Sat.:     0     0     0  2880     0  1600  2880  4800     0     0  3321  1479
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00  0.05  0.00  0.07  0.04  0.09  0.00  0.00  0.14  0.14
Crit Moves:                               ****  ****                    ****
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Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #13 Nogales Street (NS) at San Jose Avenue (EW) - #13

Cycle (sec):	100	Critical Vol./Cap.(X):	0.661
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Nogales Street						San Jose Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 2 1 0			1 0 2 1 0			1 0 0 1 0			0 1 0 0 1		
Volume Module:												
Base Vol:	226	983	100	69	1153	95	9	58	70	36	148	33
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	226	983	100	69	1153	95	9	58	70	36	148	33
Added Vol:	0	67	0	0	90	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	226	1050	100	69	1243	95	9	58	70	36	148	33
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.00	1.10	1.10	1.00	1.10
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	233	1084	103	71	1283	98	10	60	79	41	153	37
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	233	1084	103	71	1283	98	10	60	79	41	153	37
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	233	1084	103	71	1283	98	10	60	79	41	153	37
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.74	0.26	1.00	2.79	0.21	1.00	0.43	0.57	0.21	0.79	1.00
Final Sat.:	1600	4383	417	1600	4459	341	1600	687	913	338	1262	1600
Capacity Analysis Module:												
Vol/Sat:	0.15	0.25	0.25	0.04	0.29	0.29	0.01	0.09	0.09	0.03	0.12	0.02
Crit Moves:	****				****		****				****	

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #13 Nogales Street (NS) at San Jose Avenue (EW) - #13

Cycle (sec):	100	Critical Vol./Cap.(X):	0.921
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	E

Street Name:	Nogales Street						San Jose Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2	1 0	1 0	2	1 0	1 0	0	1 0	0 1	0	0 1
Volume Module:												
Base Vol:	60	1208	57	48	891	48	122	309	233	88	87	62
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	60	1208	57	48	891	48	122	309	233	88	87	62
Added Vol:	0	116	0	0	131	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	60	1324	57	48	1022	48	122	309	233	88	87	62
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.00	1.10	2.00	1.00	2.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	63	1392	60	50	1075	50	141	325	270	185	91	130
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	63	1392	60	50	1075	50	141	325	270	185	91	130
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	63	1392	60	50	1075	50	141	325	270	185	91	130
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.88	0.12	1.00	2.87	0.13	1.00	0.55	0.45	0.67	0.33	1.00
Final Sat.:	1600	4602	198	1600	4585	215	1600	875	725	1071	529	1600
Capacity Analysis Module:												
Vol/Sat:	0.04	0.30	0.30	0.03	0.23	0.23	0.09	0.37	0.37	0.12	0.17	0.08
Crit Moves:		****		****				****		****		

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Saturday Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #13 Nogales Street (NS) at San Jose Avenue (EW) - #13

Cycle (sec):	100	Critical Vol./Cap.(X):	0.606
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Nogales Street						San Jose Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 2 1 0			1 0 2 1 0			1 0 0 1 0			0 1 0 0 1		
Volume Module:												
Base Vol:	77	1027	160	38	1150	53	16	42	33	147	61	64
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	77	1027	160	38	1150	53	16	42	33	147	61	64
Added Vol:	0	154	0	0	166	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	77	1181	160	38	1316	53	16	42	33	147	61	64
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.00	1.10	1.10	1.00	1.10
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	81	1235	167	40	1377	55	18	44	38	169	64	74
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	81	1235	167	40	1377	55	18	44	38	169	64	74
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	81	1235	167	40	1377	55	18	44	38	169	64	74
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.64	0.36	1.00	2.88	0.12	1.00	0.54	0.46	0.73	0.27	1.00
Final Sat.:	1600	4227	573	1600	4614	186	1600	858	742	1162	438	1600
Capacity Analysis Module:												
Vol/Sat:	0.05	0.29	0.29	0.02	0.30	0.30	0.01	0.05	0.05	0.11	0.15	0.05
Crit Moves:	****				****			****		****		

```
--------------------------------------------------------------------------------
                            Rowland Heights Plaza
                 Existing Plus Project Plus Cumulative Projects
                          Weekday Morning Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #15 Nogales Street (NS) at Gale Avenue/Walnut Drive (EW) - #15
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.934
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       100              Level Of Service:                  E
********************************************************************************
Street Name:             Nogales Street                Gale Avenue/Walnut Drive
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Prot+Permit       Prot+Permit
Rights:          Include          Include           Include           Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         1  0  2  1  0    1  0  2  1  0    1  0  0  1  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     291 1330   168   183  913   146    49   73    55   104  228   146
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  291 1330   168   183  913   146    49   73    55   104  228   146
Added Vol:    116    0     0     0    0    90    67    0    85     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  407 1330   168   183  913   236   116   73   140   104  228   146
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:   424 1387   175   191  952   246   121   76   146   108  238   152
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  424 1387   175   191  952   246   121   76   146   108  238   152
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  424 1387   175   191  952   246   121   76   146   108  238   152
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 2.66  0.34  1.00 2.38  0.62  1.00 0.34  0.66  1.00 0.61  0.39
Final Sat.:  1600 4262   538  1600 3814   986  1600  548  1052  1600  975   625
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.27 0.33  0.33  0.12 0.25  0.25  0.08 0.14  0.14  0.07 0.24  0.24
Crit Moves:  ****                  ****        ****                   ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                            Rowland Heights Plaza
               Existing Plus Project Plus Cumulative Projects
                          Weekday Evening Peak Hour
--------------------------------------------------------------------------------

                     Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #15 Nogales Street (NS) at Gale Avenue/Walnut Drive (EW) - #15
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         1.358
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100              Level Of Service:                  F
********************************************************************************
Street Name:              Nogales Street             Gale Avenue/Walnut Drive
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Protected        Protected       Prot+Permit      Prot+Permit
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         1  0  2  1  0    1  0  2  1  0    1  0  0  1  0    1  0  0  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      217   991    70   120  1088    97   239   341   366   227   236    91
Growth Adj:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   217   991    70   120  1088    97   239   341   366   227   236    91
Added Vol:     163     0     0     0     0   131   116     0   145     0     0     0
PasserByVol:     0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   380   991    70   120  1088   228   355   341   511   227   236    91
User Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:      0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94
PHF Volume:    403  1051    74   127  1154   242   376   362   542   241   250    97
Reduct Vol:      0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   403  1051    74   127  1154   242   376   362   542   241   250    97
PCE Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:   403  1051    74   127  1154   242   376   362   542   241   250    97
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:     1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:        1.00  2.80  0.20  1.00  2.48  0.52  1.00  0.40  0.60  1.00  0.72  0.28
Final Sat.:   1600  4483   317  1600  3968   832  1600   640   960  1600  1155   445
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:      0.25  0.23  0.23  0.08  0.29  0.29  0.24  0.56  0.56  0.15  0.22  0.22
Crit Moves:   ****                    ****              ****        ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                       Rowland Heights Plaza
          Existing Plus Project Plus Cumulative Projects
                         Saturday Peak Hour
--------------------------------------------------------------------------------

                  Level Of Service Computation Report
     ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #15 Nogales Street (NS) at Gale Avenue/Walnut Drive (EW) - #15
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):          1.291
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100              Level Of Service:                   F
********************************************************************************
Street Name:             Nogales Street              Gale Avenue/Walnut Drive
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected       Prot+Permit      Prot+Permit
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       1  0  2  1  0   1  0  2  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     278 1055    99   100  949   215   202  216   381   149  321    89
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  278 1055    99   100  949   215   202  216   381   149  321    89
Added Vol:    206    0     0     0    0   166   154    0   191     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  484 1055    99   100  949   381   356  216   572   149  321    89
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98
PHF Volume:   495 1079   101   102  970   390   364  221   585   152  328    91
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  495 1079   101   102  970   390   364  221   585   152  328    91
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  495 1079   101   102  970   390   364  221   585   152  328    91
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 2.74  0.26  1.00 2.14  0.86  1.00 0.27  0.73  1.00 0.78  0.22
Final Sat.:  1600 4388   412  1600 3425  1375  1600  439  1161  1600 1253   347
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.31 0.25  0.25  0.06 0.28  0.28  0.23 0.50  0.50  0.10 0.26  0.26
Crit Moves:  ****                   ****             ****        ****
********************************************************************************
```

```
-------------------------------------------------------------------------------
                        Rowland Heights Plaza
           Existing Plus Project Plus Cumulative Projects
                       Weekday Morning Peak Hour
-------------------------------------------------------------------------------

                   Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
*******************************************************************************
Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16
*******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.679
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100               Level Of Service:                  B
*******************************************************************************
Street Name:              Nogales Street              SR-60 Freeway WB Ramps
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Ignore           Ignore          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        0  0  3  0  1   0  0  3  0  1   0  0  0  0  0   0  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1169   281     0  848   223     0    0     0   290    0   621
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1169   281     0  848   223     0    0     0   290    0   621
Added Vol:      0   57     0     0   85     0     0    0     0     1    0    59
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 1226   281     0  933   223     0    0     0   291    0   680
User Adj:    1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.97 0.97  0.00  0.97 0.97  0.00  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:     0 1270     0     0  967     0     0    0     0   302    0   705
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1270     0     0  967     0     0    0     0   302    0   705
PCE Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 1270     0     0  967     0     0    0     0   302    0   705
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 3.00  1.00  0.00 3.00  1.00  0.00 0.00  0.00  0.60 0.00  1.40
Final Sat.:     0 4800  1600     0 4800  1600     0    0     0   959    0  2241
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.26  0.00  0.00 0.20  0.00  0.00 0.00  0.00  0.19 0.00  0.31
Crit Moves:       ****        ****                                          ****
*******************************************************************************
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```
--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                Existing Plus Project Plus Cumulative Projects
                         Weekday Evening Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):          0.663
Loss Time (sec):      10 (Y+R=0.0 sec)  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:       100                Level Of Service:                   B
********************************************************************************
Street Name:              Nogales Street                SR-60 Freeway WB Ramps
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted         Permitted         Permitted         Permitted
Rights:          Ignore            Ignore            Include           Include
Min. Green:    0     0     0     0     0     0     0     0     0     0     0     0
Lanes:       0  0  3  0  1     0  0  3  0  1     0  0  0  0  0     0  0  1!  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  1019   216     0  1226   454     0     0     0   383     0   262
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   0  1019   216     0  1226   454     0     0     0   383     0   262
Added Vol:     0    85     0     0   145     0     0     0     0     1     0    78
PasserByVol:   0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   0  1104   216     0  1371   454     0     0     0   384     0   340
User Adj:    1.00  1.00  0.00  1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.93  0.93  0.00  0.93  0.93  0.00  0.93  0.93  0.93  0.93  0.93  0.93
PHF Volume:    0  1183     0     0  1469     0     0     0     0   412     0   364
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   0  1183     0     0  1469     0     0     0     0   412     0   364
PCE Adj:     1.00  1.00  0.00  1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  0.00  1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:   0  1183     0     0  1469     0     0     0     0   412     0   364
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       0.00  3.00  1.00  0.00  3.00  1.00  0.00  0.00  0.00  1.00  0.00  1.00
Final Sat.:    0  4800  1600     0  4800  1600     0     0     0  1600     0  1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.25  0.00  0.00  0.31  0.00  0.00  0.00  0.00  0.26  0.00  0.23
Crit Moves:  ****                    ****                          ****
********************************************************************************
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--------------------------------------------------------------------------------
                              Rowland Heights Plaza
                 Existing Plus Project Plus Cumulative Projects
                               Saturday Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16
********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):         0.700
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100                 Level Of Service:                  B
********************************************************************************
Street Name:             Nogales Street                SR-60 Freeway WB Ramps
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted         Permitted         Permitted         Permitted
Rights:          Ignore            Ignore            Include           Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         0  0  3  0  1   0  0  3  0  1   0  0  0  0  0   0  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  991   364    0 1125   401    0    0     0  435    0   418
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0  991   364    0 1125   401    0    0     0  435    0   418
Added Vol:      0  107     0    0  191     0    0    0     0    1    0    99
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0 1098   364    0 1316   401    0    0     0  436    0   517
User Adj:    1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.00 0.95 0.95  0.00 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:     0 1151     0    0 1379     0    0    0     0  457    0   542
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0 1151     0    0 1379     0    0    0     0  457    0   542
PCE Adj:     1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0 1151     0    0 1379     0    0    0     0  457    0   542
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600  1600
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 3.00  1.00 0.00 3.00  1.00 0.00 0.00  0.00 0.92 0.00  1.08
Final Sat.:     0 4800  1600    0 4800  1600    0    0     0 1464    0  1736
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.24  0.00 0.00 0.29  0.00 0.00 0.00  0.00 0.29 0.00  0.31
Crit Moves:  ****                  ****                                   ****
********************************************************************************
```

```
---------------------------------------------------------------------------
                          Rowland Heights Plaza
                Existing Plus Project Plus Cumulative Projects
                       Weekday Morning Peak Hour
---------------------------------------------------------------------------

                     Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
***************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
***************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.562
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100              Level Of Service:                  A
***************************************************************************
Street Name:                Nogales Street           SR-60 Freeway EB Ramps
Approach:        North Bound      South Bound      East Bound      West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Ignore           Ignore          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  3  0  1    0  0  3  0  1    1  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1049   387     0  926   212   401    0   243     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1049   387     0  926   212   401    0   243     0    0     0
Added Vol:      0   57     0     0   43    43     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 1106   387     0  969   255   401    0   243     0    0     0
User Adj:    1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.00  0.94 0.94  0.00  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:     0 1183     0     0 1036     0   429    0   260     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1183     0     0 1036     0   429    0   260     0    0     0
PCE Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 1183     0     0 1036     0   429    0   260     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 3.00  1.00  0.00 3.00  1.00  1.24 0.01  0.75  0.00 0.00  0.00
Final Sat.:     0 4800  1600     0 4800  1600  1993    0  1207     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.25  0.00  0.00 0.22  0.00  0.22 0.00  0.22  0.00 0.00  0.00
Crit Moves:       ****        ****             ****
***************************************************************************
```

```
------------------------------------------------------------------------------
                           Rowland Heights Plaza
              Existing Plus Project Plus Cumulative Projects
                         Weekday Evening Peak Hour
------------------------------------------------------------------------------

                     Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
******************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
******************************************************************************
Cycle (sec):        100              Critical Vol./Cap.(X):        0.701
Loss Time (sec):     10 (Y+R=0.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:      100              Level Of Service:                 C
******************************************************************************
Street Name:              Nogales Street               SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:       Permitted         Permitted         Permitted         Permitted
Rights:          Ignore            Ignore           Include           Include
Min. Green:    0     0     0     0     0     0     0     0     0     0     0     0
Lanes:       0  0  3  0  1    0  0  3  0  1    1  0  1! 0  0    0  0  0  0  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      0   840   288     0  1322   287   397     0   420     0     0     0
Growth Adj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   0   840   288     0  1322   287   397     0   420     0     0     0
Added Vol:     0    85     0     0    75    71     0     0     0     0     0     0
PasserByVol:   0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   0   925   288     0  1397   358   397     0   420     0     0     0
User Adj:   1.00  1.00  0.00  1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:    0.92  0.92  0.00  0.92  0.92  0.00  0.92  0.92  0.92  0.92  0.92  0.92
PHF Volume:    0  1004     0     0  1517     0   431     0   456     0     0     0
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   0  1004     0     0  1517     0   431     0   456     0     0     0
PCE Adj:    1.00  1.00  0.00  1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:    1.00  1.00  0.00  1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:   0  1004     0     0  1517     0   431     0   456     0     0     0
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:   1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:      0.00  3.00  1.00  0.00  3.00  1.00  1.00  0.00  1.00  0.00  0.00  0.00
Final Sat.:    0  4800  1600     0  4800  1600  1600     0  1600     0     0     0
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:    0.00  0.21  0.00  0.00  0.32  0.00  0.27  0.00  0.29  0.00  0.00  0.00
Crit Moves: ****                    ****                    ****
******************************************************************************
```

```
--------------------------------------------------------------------------------
                              Rowland Heights Plaza
                  Existing Plus Project Plus Cumulative Projects
                               Saturday Peak Hour
--------------------------------------------------------------------------------
                         Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.618
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100              Level Of Service:                  B
********************************************************************************
Street Name:             Nogales Street              SR-60 Freeway EB Ramps
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Ignore           Ignore           Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  3  0  1   0  0  3  0  1   1  0  1! 0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  947   423    0 1160   370  415    0   352    0    0     0
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  947   423    0 1160   370  415    0   352    0    0     0
Added Vol:     0  107     0    0  101    92    0    0     0    0    0     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   0 1054   423    0 1261   462  415    0   352    0    0     0
User Adj:   1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    0.97 0.97  0.00 0.97 0.97  0.00 0.97 0.97  0.97 0.97 0.97  0.97
PHF Volume:    0 1087     0    0 1300     0  428    0   363    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0 1087     0    0 1300     0  428    0   363    0    0     0
PCE Adj:    1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   0 1087     0    0 1300     0  428    0   363    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600  1600
Adjustment: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:      0.00 3.00  1.00 0.00 3.00  1.00 1.08 0.00  0.92 0.00 0.00  0.00
Final Sat.:    0 4800  1600    0 4800  1600 1731    0  1469    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00 0.23  0.00 0.00 0.27  0.00 0.25 0.00  0.25 0.00 0.00  0.00
Crit Moves: ****                 ****       ****
********************************************************************************
```

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Morning Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #18 Nogales Street (NS) at Colima Road (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.841
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	D

Street Name:	Nogales Street						Colima Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	2 0	1	2 0	2 0	1	2 0	2 1	0	2 0	2 1	0
Volume Module:												
Base Vol:	313	741	137	248	626	244	356	576	202	180	668	333
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	313	741	137	248	626	244	356	576	202	180	668	333
Added Vol:	5	24	0	12	18	13	17	4	4	0	5	17
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	318	765	137	260	644	257	373	580	206	180	673	350
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	348	836	150	284	704	281	408	634	225	197	736	383
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	348	836	150	284	704	281	408	634	225	197	736	383
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	348	836	150	284	704	281	408	634	225	197	736	383
OvlAdjVol:						54						
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	2.21	0.79	2.00	2.00	1.00
Final Sat.:	2880	3200	1600	2880	3200	1600	2880	3542	1258	2880	3200	1600
Capacity Analysis Module:												
Vol/Sat:	0.12	0.26	0.09	0.10	0.22	0.18	0.14	0.18	0.18	0.07	0.23	0.24
OvlAdjV/S:						0.03						
Crit Moves:		****		****			****					****

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Evening Peak Hour

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #18 Nogales Street (NS) at Colima Road (EW)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.753
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						Colima Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	2 0	1	2 0	2 0	1	2 0	2 1	0	2 0	2 1	0
Volume Module:												
Base Vol:	231	531	163	440	769	386	335	889	197	186	609	224
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	231	531	163	440	769	386	335	889	197	186	609	224
Added Vol:	6	38	0	21	33	22	24	5	5	0	6	23
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	237	569	163	461	802	408	359	894	202	186	615	247
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	241	579	166	469	816	415	365	909	205	189	626	251
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	241	579	166	469	816	415	365	909	205	189	626	251
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	241	579	166	469	816	415	365	909	205	189	626	251
OvlAdjVol:						212						
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	2.45	0.55	2.00	2.14	0.86
Final Sat.:	2880	3200	1600	2880	3200	1600	2880	3915	885	2880	3425	1375
Capacity Analysis Module:												
Vol/Sat:	0.08	0.18	0.10	0.16	0.25	0.26	0.13	0.23	0.23	0.07	0.18	0.18
OvlAdjV/S:						0.13						
Crit Moves:		****		****			****				****	

```
--------------------------------------------------------------------------------
                              Rowland Heights Plaza
                Existing Plus Project Plus Cumulative Projects
                               Saturday Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
      ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
********************************************************************************
Intersection #18 Nogales Street (NS) at Colima Road (EW)
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):          0.871
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        100              Level Of Service:                   D
********************************************************************************
Street Name:              Nogales Street                    Colima Road
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected        Protected        Protected
Rights:           Include            Ovl            Include          Include
Min. Green:      0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         2  0  2  0  1   2  0  2  0  1   2  0  2  1  0   2  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      269   533   118   376   527   512   461   733   183   150   769   283
Growth Adj:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   269   533   118   376   527   512   461   733   183   150   769   283
Added Vol:       7    48     0    27    44    29    31     7     7     0     8    29
PasserByVol:     0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   276   581   118   403   571   541   492   740   190   150   777   312
User Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:      0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93
PHF Volume:    296   623   126   432   612   580   527   793   204   161   833   334
Reduct Vol:      0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   296   623   126   432   612   580   527   793   204   161   833   334
PCE Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:   296   623   126   432   612   580   527   793   204   161   833   334
OvlAdjVol:                                     287
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:   0.90  1.00  1.00  0.90  1.00  1.00  0.90  1.00  1.00  0.90  1.00  1.00
Lanes:        2.00  2.00  1.00  2.00  2.00  1.00  2.00  2.39  0.61  2.00  2.14  0.86
Final Sat.:   2880  3200  1600  2880  3200  1600  2880  3819   981  2880  3425  1375
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.10  0.19  0.08  0.15  0.19  0.36  0.18  0.21  0.21  0.06  0.24  0.24
OvlAdjV/S:                                    0.18
Crit Moves:         ****        ****              ****                    ****
********************************************************************************
```

APPENDIX E

Traffic Signal Warrant Worksheets

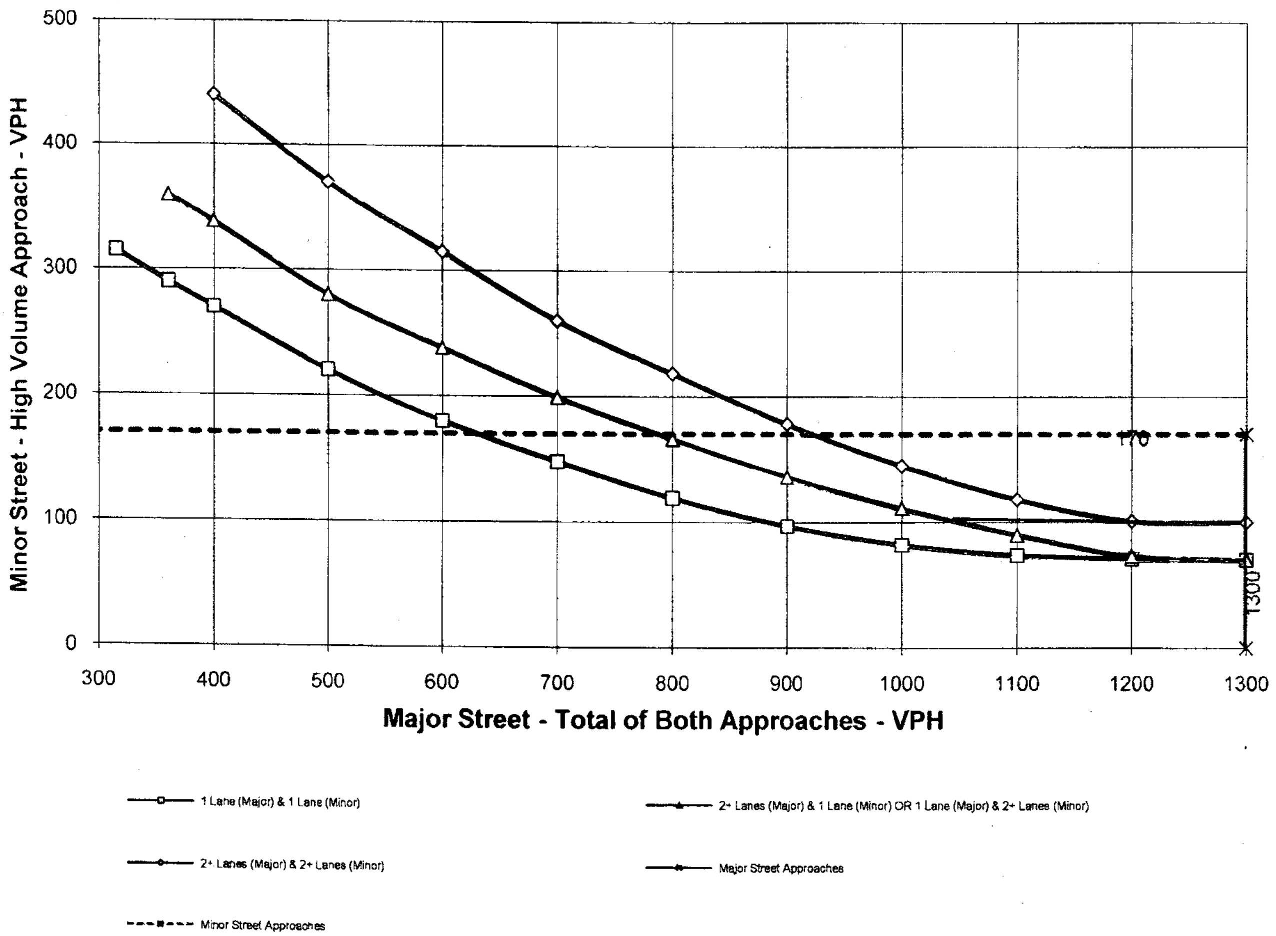
PEAK HOUR VOLUME WARRANT

Existing Plus Project

Major Street Name = **Gale Avenue** Total of Both Approaches (VPH) = **1693**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Project Central Access** High Volume Approach (VPH) = **170**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



** NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

APPENDIX F

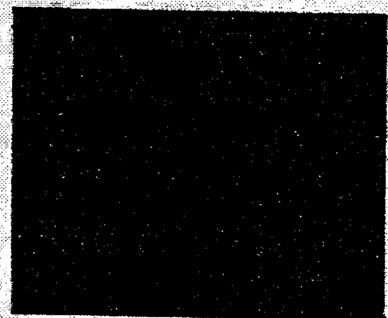
Pass-By Trips

CHAPTER 5

Pass-by, Primary, and Diverted Linked Trips

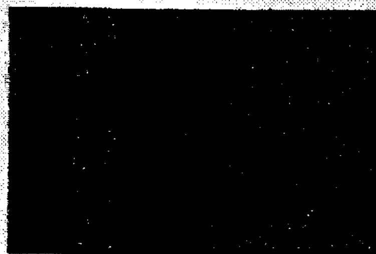
5.1 Background

The trip generation rates and equations contained in *Trip Generation* are derived from actual measurements of traffic generated by individual sites. These rates and equations represent vehicles entering and exiting a site at its driveways. Therefore, these volumes are appropriate for determining the total traffic to be accommodated by site driveways.



There are instances, however, when the total number of trips generated by a site is different from the amount of new traffic **added** to the street system by the generator. For example, retail-oriented developments such as shopping centers, discount stores, restaurants, banks, service stations, and convenience markets often locate adjacent to busy streets in order to attract the motorists already on the street. These sites attract a portion of their trips from traffic passing the site on the way from an origin to an ultimate destination. These retail trips **may not add new traffic** to the adjacent street system.

Trip-making can be broken down into two major categories: **pass-by trips** and **non-pass-by trips.** In some traffic impact study applications, it is necessary to further subdivide non-pass-by trips into **primary trips** and **diverted linked** trips. These trip types are illustrated in figure 5.1 and are defined below.



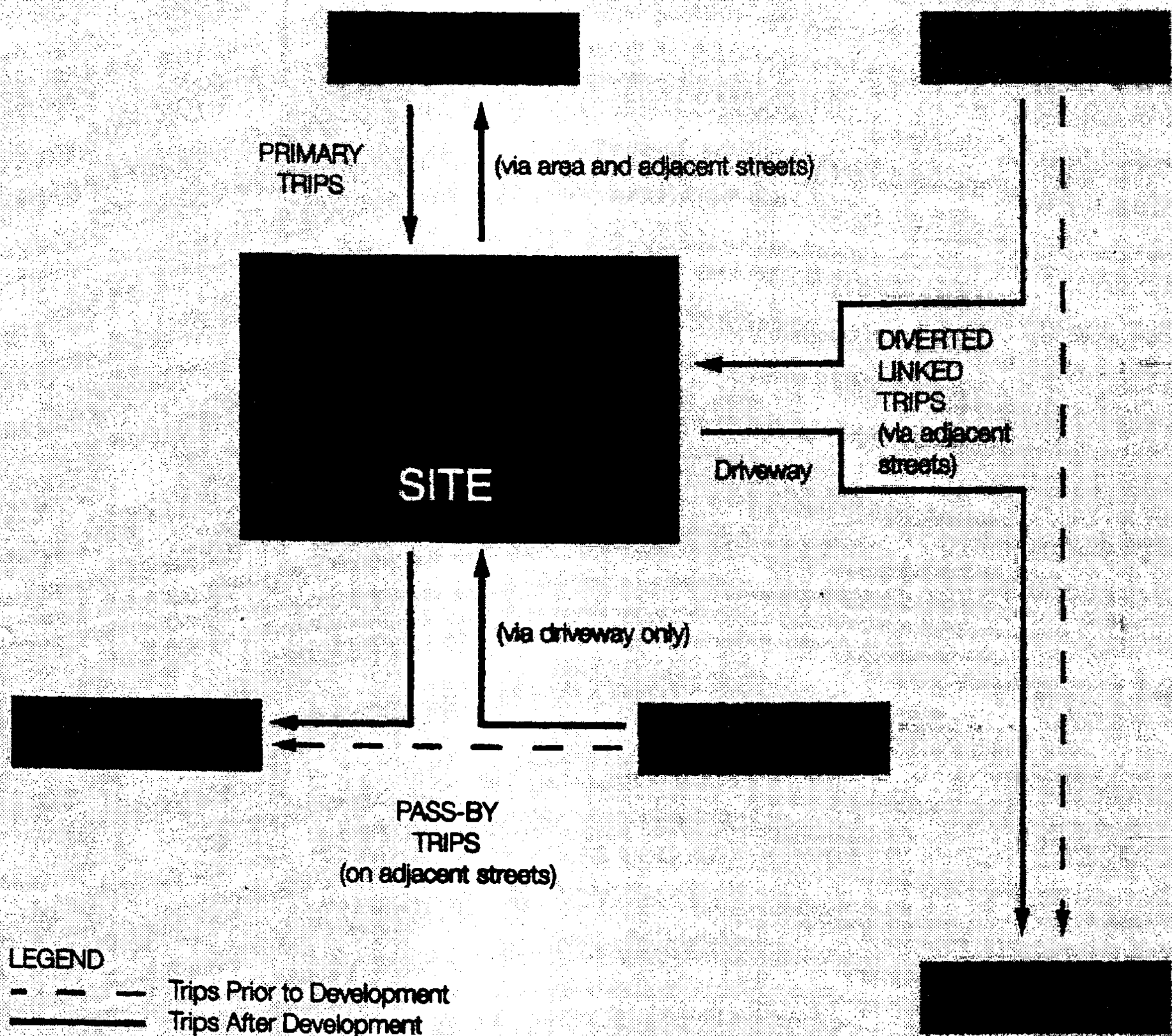
Pass-by trips are made as intermediate stops *on the way* from an origin to a primary trip destination without a route diversion. Pass-by trips are attracted from traffic passing the site ***on an adjacent street*** or roadway that offers direct access to the generator. **Pass-by trips are not diverted from another roadway.**

Non-pass-by trips are simply all trips generated by a site that are not pass-by trips. This term is sometimes used when diverted linked trips are not tabulated separately from primary trips.

Primary trips are trips made for the specific purpose of visiting the generator. The stop at the generator is the primary reason for the trip. The trip typically goes from origin to generator and then returns to the origin. For example, a home-to-shopping-to-home combination of trips is a primary trip set.

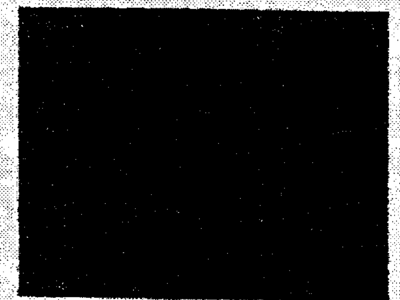
Diverted linked trips are trips that are attracted from the traffic volume on roadways within the vicinity of the generator but that require a diversion from that roadway to another roadway to gain access to the site. These trips could travel on highways or freeways adjacent to a generator, but without access to the generator. **Diverted linked trips add traffic to streets adjacent to a site, but may not add traffic to the area's major travel routes** (see figure 5.1). Both pass-by and diverted linked trips may be part of a multiple-stop chain of trips.

Figure 5.1 Types of Trips



5.2 Sample Application of Pass-By Trip Assignment Process

In this example, the objectives are to (1) estimate the number of new trips added to the adjacent street traffic volume with the development of a shopping center with 580,000 square feet of gross leasable area, and (2) determine the turn movements at the shopping center driveway. The forecasted two-way evening peak hour traffic on a street adjacent to the proposed shopping center is 1,200 vehicles, as shown in figure 5.2(A)—1,000 traveling west and 200 traveling east.



The shopping center is estimated to generate 2,000 evening peak hour trips (based on the fitted curve equation given for Land Use Code 820 on page 1,339 of *Trip Generation*, Sixth Edition). An assessment of the shopping center parking configuration and access points indicates that an estimated 20 percent of the site-generated traffic will use the driveway being analyzed in this example. Thus, the driveway volume is estimated to be 400 evening peak hour trips (i.e., 20 percent of 2,000 trips). For this example, 50 percent enter and 50 percent exit the shopping center (as shown in figure 5.2(B)).

From data collected at other shopping centers, it is estimated (in this example) that about 15 percent of the driveway volume is pass-by (figure 5.2(B)). Therefore, 30 of the inbound vehicles (i.e., 15 percent of 200 vehicles) and 30 of the outbound vehicles are considered pass-by trips.

The assumed trip distribution for the non-pass-by trips is shown in figure 5.2(C). These values are based on local knowledge of expected trip patterns for primary and diverted linked trips to and from the shopping center (based on existing travel patterns, surrounding land uses, etc.). For example, 80 percent of the non-pass-by trips are expected to arrive from the east and to return to the east after the trip to the shopping center.

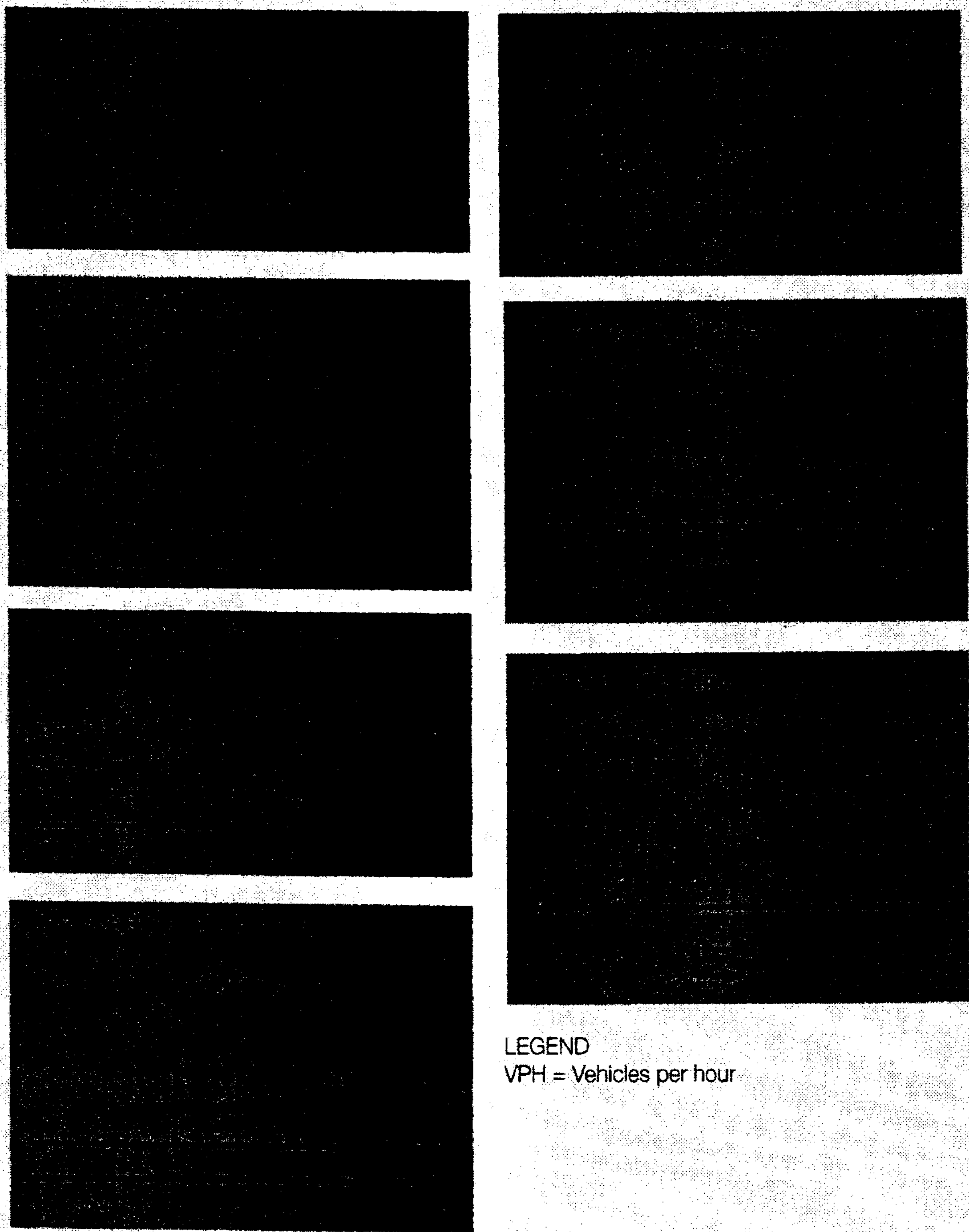
The distribution of the pass-by trips is based on the volume of traffic passing the driveway, as shown in figure 5.2(D). Because 83 percent of the traffic passing by the site comes from the east (i.e., 1,000 of the 1,200 shown previously in figure 5.2 (A)), it is assumed that 83 percent of the pass-by trips will likewise arrive from the east and will depart toward the west.

The assignment of the non-pass-by trips generated by the site is shown in figure 5.2(E). The total number of non-pass-by trips destined to the site is 170 (the 200 total trips minus the 30 inbound pass-by trips shown earlier in figure 5.2(B)). Eighty percent (or 136) are expected to arrive from the east and to return to the east.

The assignment of the pass-by trips is shown in figure 5.2(F). Of the 30 pass-by trips, 83 percent (or 25) arrive from the east and depart to the west. Likewise, 17 percent (or 5) arrive from the west and depart to the east. Note that the calculation also shows the expected through-trip reductions as the trips passing the site turn into the new driveway. For example, the new westbound right-turn volume of 25 causes a reduction in the westbound through movement.

The final assignment of all trips entering and leaving the shopping center driveway, as well as passing the driveway, is shown in figure 5.2(G). These values are simply the sum of the base volumes (from figure 5.2(A)), the non-pass-by trips generated by the site (from figure 5.2(E)), and the pass-by trips generated by the site (from figure 5.2(F)). Note that the through-traffic volumes in both directions on the major street are reduced as a result of the pass-by trip analysis.

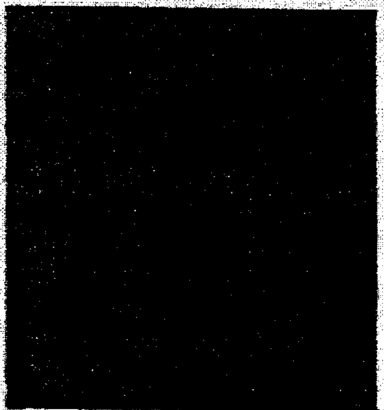
Figure 5.2 Application of Pass-By Trips



LEGEND
VPH = Vehicles per hour

5.3 Cautions

Statistical analysis and correlation of the pass-by data collected by the profession continue to evolve. However, due to the limited amount of pass-by data available and the inherent variability in surveyed site characteristics, it has still proven difficult to obtain high correlation indices.



Traditional pass-by trip analyses have attempted to correlate pass-by trip percentages (i.e., percent of the total number of trips generated by a site) with units of occupied site development (such as gross leasable area, gross floor area, seats in a restaurant, or fueling positions at a gas/service station). Limited results for some land uses show that this correlation can be enhanced further by including the magnitude of the traffic passing the site on the adjacent roadways.

The analyst should exercise caution in the use of pass-by and diverted linked data presented in this chapter to ensure that the following aspects of pass-by trip characteristics are handled appropriately in the analysis process.

Diverted linked trips are clearly different from pass-by trips. Diverted linked trips add trips to the adjacent roads at a proposed or expanded site, but may not add trips to nearby major highways or freeways.

Diverted linked trips are often difficult to identify. Therefore, **diverted linked trips should be treated similarly to primary trips,** unless: (1) all three (primary, pass-by, and diverted linked) categories are being analyzed and processed separately, and (2) the travel routes for diverted linked trips can be clearly established.

Pass-by trips are drawn from the passing traffic stream, **but are always included in the site driveway movements.** In traffic analyses, summation of driveway volumes must equal the total external site generation (i.e., the sum of primary, pass-by, and diverted linked trips). Pass-by trips are not included in (and thus, subtracted from) the through-volumes passing a given site access point on an adjacent road. Standard methodologies for assessing the traffic impacts of site development typically require that diverted linked trips be included as additional trips within the confines of local impact assessment studies.

In a multi-use development, it is likely that there will be trips internal to the site (refer to chapter 7 for guidance). Before applying the pass-by reduction, the internal trips should be removed from the total number of trips generated by the multi-use site. **Pass-by trips are only applicable to trips that enter or exit the site, not internal trips.**

Overall, diverted linked trips represent a change in local area travel patterns but constitute no new increase on a *macroscopic* scale. Within the immediate study area, diverted linked trips do represent additional traffic on individual streets and should be analyzed that way.

5.4 Data Base on Pass-By, Primary, and Diverted Linked Trips

Listed in table 5.1 are 19 land uses for which ITE has received and compiled pass-by and diverted linked trip data. The table denotes whether the data are presented in this handbook in a table or a figure (in a data plot similar to those presented in *Trip Generation* for trip end data). Table 5.1 also identifies the time periods for which the data have been reported.

Tables 5.2 through 5.26 present the values for percentage of site generation that is accounted for by pass-by, non-pass-by, primary, and diverted linked trips.

Figures 5.3 through 5.15 plot the average *pass-by* trip percentages associated with the various land uses. No plots are provided for *diverted linked* trips. These figures are provided to enable the user to visualize the data scatter provided in tables 5.2 through 5.26.

Data plots are provided for each land use where nine or more data points are available for a specific independent variable.

For all land uses except shopping centers, data are plotted for only one independent variable. For shopping centers, data are plotted for GLA and peak hour traffic on adjacent streets for the weekday evening peak period; GLA is also used as the independent variable for shopping centers during the midday Saturday time period.

A regression equation is shown on the data plot if there are more than 10 points and the R^2 is greater than 0.25 (which only occurs on two of the Land Use Code 820 data plots). Note that this threshold is less than the 0.5 threshold for R^2 used for data plots in *Trip Generation*.

Recommended guidelines for using the data presented in these figures and tables are provided in section 5.5 of this chapter. In particular, the guidelines recommend when to use the data and how to select a pass-by percentage.

Users of the data are cautioned that the number and geographic distribution of sites are limited. Little or no data on adjacent street traffic volumes have been collected for uses other than shopping centers. The actual pass-by and diverted

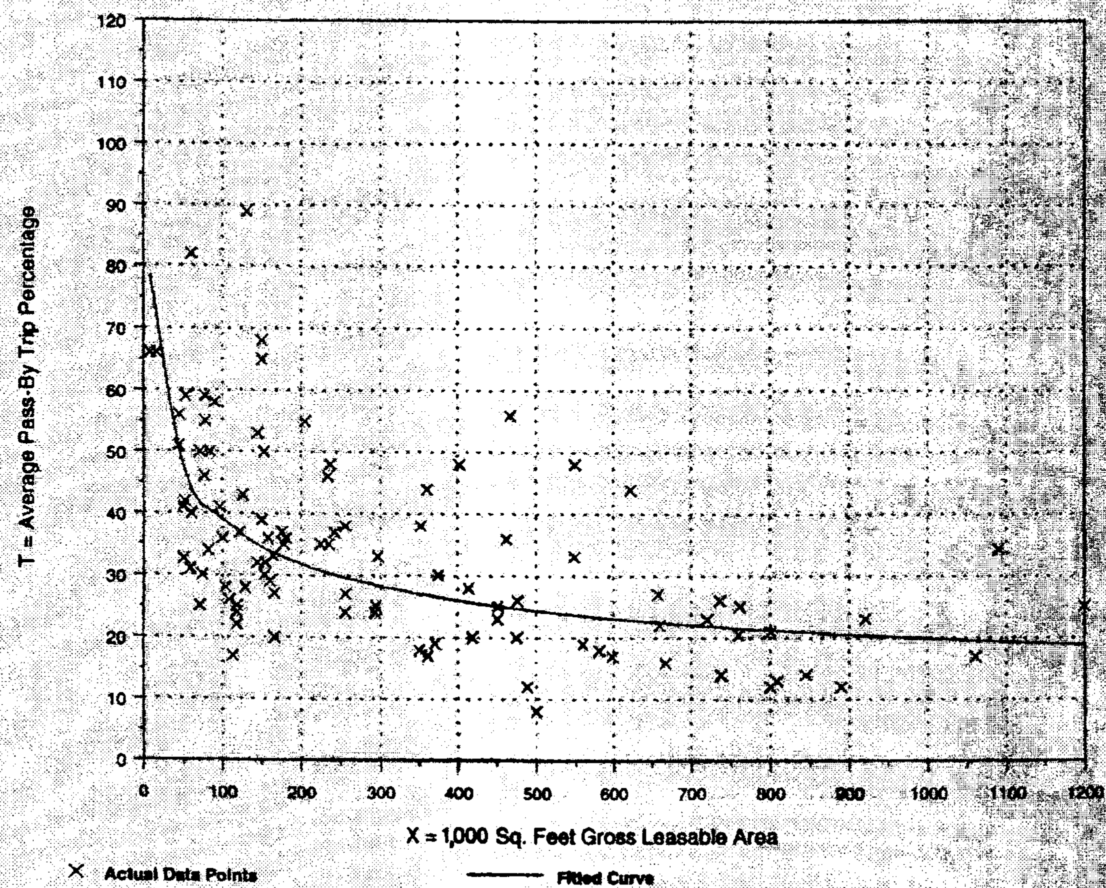
linked trip percentages may vary by site due to the specific influences of the characteristics of passing traffic, area roadway network patterns, specific businesses in the site being analyzed, other nearby development, and so forth. Surveys of similar developments near the analysis site are encouraged.

Because data are limited for many of the land uses, the analyst is encouraged to collect pass-by trip data and transmit the data to ITE. Section 5.6 of this chapter describes how to collect the appropriate data and provides sample forms to use.

Figure 5.5 Shopping Center (820)

Average Pass-By Trip Percentage vs:	**1,000 Sq. Feet Gross Leasable Area**
On a:	**Weekday, P.M. Peak Period**
Number of Studies:	100
Average 1,000 Sq. Feet GLA:	329

Data Plot



Fitted Curve Equation: $Ln(T) = -0.291\ Ln(X) + 5.001$ $R^2 = 0.37$

APPENDIX G

California Department of Transportation
Freeway Off-Ramp Queue Analysis

Freeway Ramp Queuing Analysis

								95th Percentile Queue																						
								Feet									Vehicles													Percent of Queuing Area
Intersection Number	Scenario	Ramp Storage Area			Lanes			Weekday						Saturday			Weekday						Saturday			AM	PM	Sat	Maximum Queue	
		Feet		Vehicles				Morning			Evening						Morning			Evening										
		Total	Reduced by 15%		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right					
	Existing	1,680	1,428	47.6	1.5	0.0	1.5	390	0	510	360	0	330	510	0	450	12.3	0.0	16.8	11.7	0.0	10.7	16.2	0.0	14.9	29.1	22.4	31.1	31.1	65%
	Existing Plus Project	1,680	1,428	47.6	1.5	0.0	1.5	390	0	510	360	0	330	510	0	450	12.3	0.0	16.8	11.7	0.0	10.7	16.2	0.0	14.9	29.1	22.4	31.1	31.1	65%
2	Existing Plus Project Plus Cumulative	1,680	1,428	47.6	1.5	0.0	1.5	390	0	510	360	0	330	510	0	450	12.4	0.0	16.8	11.8	0.0	10.7	16.4	0.0	14.9	29.2	22.5	31.3	31.3	66%
	Existing	1,752	1,489	49.6	1.5	0.5	1>>	42	60	30	240	60	30	270	90	30	13.1	1.3	1.0	7.4	1.5	1.0	8.8	3.0	1.0	15.4	9.9	12.8	15.4	31%
	Existing Plus Project	1,752	1,489	49.6	1.5	0.5	1>>	45	60	30	300	60	30	360	90	30	14.6	1.3	1.0	9.5	1.5	1.0	11.6	3.0	1.0	16.9	12.0	15.6	16.9	34%
3	Existing Plus Project Plus Cumulative	1,752	1,489	49.6	1.5	0.5	1>>	45	60	30	300	60	30	360	120	30	14.6	1.4	1.0	9.5	1.7	1.0	11.6	3.2	1.0	17.0	12.2	15.8	17.0	34%
	Existing	1,974	1,678	55.9	0.5	0.0	1.5	300	0	600	480	0	300	540	0	450	9.1	0.0	19.6	15.4	0.0	9.9	17.5	0.0	14.8	28.7	25.3	32.3	32.3	58%
	Existing Plus Project	1,974	1,678	55.9	0.5	0.0	1.5	300	0	660	480	0	390	540	0	540	9.1	0.0	21.1	15.4	0.0	12.4	17.5	0.0	17.7	30.2	27.8	35.2	35.2	63%
16	Existing Plus Project Plus Cumulative	1,974	1,678	55.9	0.5	0.0	1.5	300	0	660	480	0	390	540	0	540	9.2	0.0	21.1	15.4	0.0	12.4	17.5	0.0	17.7	30.3	27.8	35.2	35.2	63%
	Existing	1,850	1,573	52.4	1.5	0.0	0.5	450	0	270	420	0	450	450	0	360	14.3	0.0	8.4	13.7	0.0	14.5	14.3	0.0	12.0	22.7	28.2	26.3	28.2	54%
	Existing Plus Project	1,850	1,573	52.4	1.5	0.0	0.5	450	0	270	420	0	450	450	0	360	14.3	0.0	8.4	13.7	0.0	14.5	14.3	0.0	12.0	22.7	28.2	26.3	28.2	54%
17	Existing Plus Project Plus Cumulative	1,850	1,573	52.4	1.5	0.0	0.5	450	0	270	420	0	450	450	0	360	14.3	0.0	8.4	13.7	0.0	14.5	14.3	0.0	12.0	22.7	28.2	26.3	28.2	54%

CALTRANS
Model 170 Controller
Traffic Design Branch
District 7

C8 PROGRAM **(Version 4)** **I. D. No.: 194240**

LOCATION: *Pomona Fwy. WB Ramps @ Fullerton Rd.* **CO:** *LA* **RTE:** *60* **PM :** 19.5

CONTROL CODE "F"

PHASE TIMING

	INTERVAL	1	2	3	4	5	6	7	8
0	WALK		7				0		0
1	DON'T WALK		12				0		0
2	MIN GREEN		10				10		9
3	TYPE 3 DET		0				0		0
4	ADDED / ACT		2.5				2.5		0.0
5	PASSAGE		5.0				5.0		3.0
6	MAX GAP		6.5				6.5		3.0
7	MIN GAP		3.5				3.5		3.0
8	MAX EXT 1		50				50		65
9	MAX EXT 2		50				50		65
A	MAX EXT 3								
B									
C	REDUCE BY		0.2				0.2		0.0
D	" EVERY		1.0				1.0		0.0
E	YELLOW		4.4				4.4		4.4
F	ALL RED		1.0				1.0		1.0
	DIRECTION		SB				NB		OFF RAMP
	DATE		06 11 15				06 11 15		06 11 15
	BY		AG				AG		AG

	C		D		E (PRE-EMPT)		FLAGS	F 1	2	3	4	5	6	7	8	
0	GAP SET		TB SEL	1	EV SEL	0	FZ PERMIT		X				X		X	0
1	MAX SET		TB HR		RR1 CLR	0	RED LOCK									1
2	C - SERV		TB MIN		EVA DLY	0	RED/YEL LOCK									2
3			PED SEL	1	EVA CLR	80	VEH RECALL		X				X			3
4			7W SEL		EVB DLY	0	PED RECALL									4
5			PERM SEL		EVB CLR	0	PED PHASES		X							5
6					EVC DLY	0	A ARROW									6
7					EVC CLR	0	B ARROW									7
8			OFF SEEK	1	EVD DLY	0	DOUBLE ENTRY									8
9			PORT FLAG	0	EVD CLR	0	MAX 2									9
A	OLA GRN				EV MAX	80	LAG PHASES	OBSERVATION ONLY								A
B	OLB GRN				RR2 CLR	0	RED REST									B
C	OLC GRN				EV CLR TIMER		REST IN WALK									C
D	OLD GRN				EV DLY TIMER		MAX 3									D
E					RR CLR TIMER		YEL START-UP								X	E
F	RAM ADD		ONE WAY	0	EV MAX TIMER		FIRST PHASE		X				X			F

NOTES AND REMARKS :

OVERLAP PHASES	
A	
B	
C	
D	

DATE START:
05/17/12
DATE END :

CONTROL CODE "F"

	0	9
0		CLK RST
9		YEAR
A		MONTH
B		DAY OF MO
C	LONG FAIL	DAY OF WK
D	SHORT FAIL	HOUR
E	MAX-VAR-INIT 20	MINUTE
F	RED REVERT 5.0	SECOND

FILE NAME:

CONTROL CODE "C"

	0		CONTROL PLANS (MAXIMUM OF 9 PLANS) 1	2	3	4	5	6	7	8	9
0	LOC ADD 1	CYCLE LENGTH	120	120	120						
1	MANUAL CP	FZ1 GRN FCTR									
2	MASTER CP										
3	CURRENT CP	FZ3 GRN FCTR									
4	LAST CP	FZ4 GRN FCTR									
5	FLASH	FZ5 GRN FCTR									
6	CURRENT OFS										
7	TRANS. CP	FZ7 GRN FCTR									
8	8 KEY BANK	FZ8 GRN FCTR	50	60	45						
9	9 KEY BANK	MULTI CYCLE									
A		OFFSET A	90	3	10						
B		OFFSET B									
C		OFFSET C									
D	MANUAL OFS	FZ3 EXTENSION									
E		FZ7 EXTENSION									
F		OFS INTERRUPT									
DIRECTION OF PROGRESSION			AV	AM	PM						
DATE			09 15 14	04 10 14	04 10 14						
BY			AG	AG	AG						

	A	B	Y-CORD "C" C	Y-CORD "D" D	E	F	FLAGS 1	2	3	4	5	6	7	8	
0	LOCAL TIMER	MASTER TIMER	RAM TEST		TB TIMR	LAG FREE		X		X		X		X	0
1	FZ1 FO	PERM FZ1	INITIAL FLASH		GAP CP1	LAG CP1		X		X		X		X	1
2	FZ2 FO		DOWN LOAD		GAP CP2	LAG CP2		X		X		X		X	2
3	FZ3 FO	PERM FZ3	PLAN OVERRIDE 1		GAP CP3	LAG CP3		X		X		X		X	3
4	FZ4 FO	PERM FZ4	PERM TIME	PERM TIME	GAP CP4	LAG CP4		X		X		X		X	4
5	FZ5 FO	PERM FZ5	LAG OFS	LAG OFS	GAP CP5	LAG CP5		X		X		X		X	5
6	FZ6 FO		FORCE OFF	FORCE OFF	GAP CP6	LAG CP6		X		X		X		X	6
7	FZ7 FO	PERM FZ7	LONG GRN	LONG GRN	GAP CP7	LAG CP7		X		X		X		X	7
8	FZ8 FO	PERM FZ8	NO GRN	NO GRN	GAP CP8	LAG CP8		X		X		X		X	8
9			PERM TIMER	PERM TIMER	GAP CP9	LAG CP9		X		X		X		X	9
A	PRES OFS	DES OFS	YC OFS	YC OFS		YC LAG C									A
B			OFFSET TIMER	OFFSET TIMER		YC LAG D									B
C			LAG GRN TIMER	LAG GRN TIMER		COORD FZ		X				X			C
D			FO TIMER	FO TIMER		HOLD	OBSERVATION ONLY								D
E			LONG GRN TIMER	LONG GRN TIMER		NEXT FZ	OBSERVATION ONLY								E
F	LOC CYC	MAS CYC	NO GRN TIMER	NO GRN TIMER		FORCE	OBSERVATION ONLY								F

C T N E T / QUICNET		DATE START:
MASTER LOC.		08/02/11
LOCAL NO.		DATE END :
SYSTEM:	LA 60	
MASTER LOC:	Here	

412 PROM MODULE DIP SWITCH

		OFF	ON
LOCATION	1		X
	2	X	
	3	X	
	4	X	
	5	X	
	6	X	
	7	X	
	8	X	
FEATURE	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
	6	X	
	7	X	
	8	X	

NOTES AND REMARKS :

CONTROL CODE "E" (THIS PAGE @ F-C-F = 0)

N	E FUNCTION	1	2	3	4	5	6	7	8	F FUNCTION	1	2	3	4	5	6	7	8	
0										C. SERV. CODE 4									0
1										C. SERV. CODE 5									1
2										Y CORD RECALL C									2
3										Y CORD RECALL D									3
5										2 PED OUTPUT		X							5
6										6 PED OUTPUT						X			6
7										4 PED OUTPUT				X					7
8										8 PED OUTPUT								X	8
A	OVERLAP "A" NOT									OVERLAP "A" ON									A
B	OVERLAP "B" NOT									OVERLAP "B" ON									B
C	OVERLAP "C" NOT									OVERLAP "C" ON									C
D	OVERLAP "D" NOT									OVERLAP "D" ON									D

NOTES AND REMARKS

(1) RESET F-C-F = 0.

DET. COUNT SAMPLING PERIOD: (F-C-F = 120)	E-1-6	0
CONTROLLING FM FLAG : (F-C-F = 112)	E-6-F	1

CONTROL CODE "D"

		A	B	C	D MAX RECALL	1	2	3	4	5	6	7	8	E MIN RECALL	1	2	3	4	5	6	7	8	F PED RECALL	1	2	3	4	5	6	7	8	
1					CP1									CP1									CP1									1
2					CP2									CP2									CP2									2
3					CP3									CP3									CP3									3
4					CP4									CP4									CP4									4
5					CP5									CP5									CP5									5
6					CP6									CP6									CP6									6
7					CP7									CP7									CP7									7
8					CP8									CP8									CP8									8
9					CP9									CP9									CP9									9
A																							TOD MAX RECALL1									A
B														CALC. PROG. I.D.									TOD MAX RECALL2									B
C														PROG. I.D. (1st 3)																		C
D														PROG.I.D.(Last 3)																		D
E	LAST PWR FAIL	HH	MM	DD										C8 VERSION NUMBER																		E
F	LAST FLASH	HH	MM	DD										LITHIUM BATTERY CONDITION 84=BAD 85=GOOD																		F

DATE START :	08/02/11
DATE END :	

LOCATION: *Pomona Fwy. WB Ramps @ Fullerton Rd.* CO: *LA* RTE: *60* P.M. *19.5*

CONTROL CODE "9" (C-O-9 = 0 OR 1)

	HR (HH)	MIN (MM)	CP	OFS		S 1	M 2	T 3	W 4	T 5	F 6	S 7
0	05	30	2	A	E		X	X	X	X	X	
1	09	30	1	A	E		X	X	X	X	X	
2	14	30	3	A	E		X	X	X	X	X	
3	19	00	1	A	E		X	X	X	X	X	
4	22	00	E		E		X	X	X	X	X	
5	10	00	1	A	E	X						X
6	22	00	E		E	X						X
7					E							
8					E							
9					E							
A					E							
B					E							
C					E							
D					E							
E					E							
F					E							

CONTROL CODE "9" (C-O-9 = 2)

	HR (HH)	MIN (MM)	CP	OFS		S 1	M 2	T 3	W 4	T 5	F 6	S 7
0					E							
1					E							
2					E							
3					E							
4					E							
5					E							
6					E							
7					E							
8					E							
9					E							
A					E							
B					E							
C					E							
D					E							
E					E							
F					E							

NOTES AND REMARKS

CONTROL CODE "7"

	HR (HH)	MIN (MM)	ACT		ON 0	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0												
1												
2				E								
3				E								
4				E								
5				E								
6				E								
7				E								
8				E								
9				E								
A				E								
B				E								
C				E								
D				E								
E				E								
F				E								

ACTIVITY CODES (CONTROL CODE "7")

1 = TYPE OF SIMULTANEOUS PHASE TERMINATION
2 = MAX 2
3 = MAX 3
4 = CONDITIONAL SERVICE (1ST SELECT)
5 = CONDITIONAL SERVICE (2ND SELECT)
6 = ENERGIZE AUXILIARY OUTPUT
7 = ENERGIZE AUXILIARY OUTPUT
8 = ENERGIZE AUXILIARY OUTPUT
9 = MAX RECALL 1
A = TRAFFIC ACTUATED MAX 2 OPERATION
B = MAX RECALL2
C = YELLOW YIELD COORDINATION
D = YELLOW YIELD COORDINATION
E = FREE OPERATION
F = FLASHING OPERATION

DATE START:	09/15/14
DATE END :	

LOCATION: *Pomona Fwy. WB Ramps @ Fullerton Rd.* **CO:** *LA* **RTE:** *60* **P.M.:** *19.5*

CONTROL CODE "D"

	SYSTEM DETECTORS 0		INPUT SLOT	DELAY 1	CARRYOVER 3	INPUT SLOT	DELAY 2	CARRYOVER 4	
0	NO. OF SLAVES	0	I1			J1			0
1			I2U			J2U			1
2			I2L			J2L			2
3			I3U			J3U			3
4			I3L			J3L			4
5			I4			J4			5
6			I5			J5			6
7			I6U			J6U			7
8			I6L			J6L			8
9			I7U			J7U			9
A			I7L			J7L			A
B			I8			J8			B
C			I9U			J9U			C
D			I9L			J9L			D

NOTES AND REMARKS :

DATE START:	08/02/11
DATE END :	

CONTROL CODE "E"

(THIS PAGE @ FCF=123)

	INPUT FILE	C (PHASE DISPLAY) 1	2	3	4	5	6	7	8	D (FUNCTION DISPLAY) RL 1	YL 2	3	4	EX 5	CO 6	CA 7	T3 8
0	I1	*												*	*		
1	I2U		*											*	*		
2	I2L		*											*	*		
3	I3U		*											*	*		
4	I3L		*											*			
5	I4		*													*	*
6	I5			*										*	*		
7	I6U				*									*	*		
8	I6L				*									*	*		
9	I7U				*									*	*		
A	I7L				*									*			
B	I8				*											*	*
C	I9U	*												*	*		
D	I9L			*										*	*		

	INPUT FILE	E (PHASE DISPLAY) 1	2	3	4	5	6	7	8	F (FUNCTION DISPLAY) RL 1	YL 2	3	4	EX 5	CO 6	CA 7	T3 8
0	J1					*								*	*		
1	J2U						*							*	*		
2	J2L						*							*	*		
3	J3U						*							*	*		
4	J3L						*							*			
5	J4						*									*	*
6	J5							*						*	*		
7	J6U								*					*	*		
8	J6L								*					*	*		
9	J7U								*					*	*		
A	J7L								*					*			
B	J8								*							*	*
C	J9U					*								*	*		
D	J9L							*						*	*		

* = Default Settings X = New Settings NOTE: Default settings (*) should remain unless replaced with new settings (X).

CONTROL CODE "8": HOLIDAY 1-16 (C-0-8=11)

	DAY (DD)	YEAR (YY)	MONTH (M)		TYPE 1	2	3	4	5	6	7
0				E							
1				E							
2				E							
3				E							
4				E							
5				E							
6				E							
7				E							
8				E							
9				E							
A				E							
B				E							
C				E							
D				E							
E				E							
F				E							

CONTROL CODE "8": HOLIDAY 17-32 (C-0-8=12)

	DAY (DD)	YEAR (YY)	MONTH (M)		TYPE 1	2	3	4	5	6	7
0				E							
1				E							
2				E							
3				E							
4				E							
5				E							
6				E							
7				E							
8				E							
9				E							
A				E							
B				E							
C				E							
D				E							
E				E							
F				E							

CONTROL CODE "9": HOLIDAY EVENT 1-16 (C-0-9=11)

	TIME (HHMM)	CP	OFS		TYPE 1	2	3	4	5	6	7
0				E							
1				E							
2				E							
3				E							
4				E							
5				E							
6				E							
7				E							
8				E							
9				E							
A				E							
B				E							
C				E							
D				E							
E				E							
F				E							

CONTROL CODE "9": HOLIDAY EVENT 17-32(C-0-9=12)

	TIME (HHMM)	CP	OFS		TYPE 1	2	3	4	5	6	7
0				E							
1				E							
2				E							
3				E							
4				E							
5				E							
6				E							
7				E							
8				E							
9				E							
A				E							
B				E							
C				E							
D				E							
E				E							
F				E							

NOTES

DATE START:

DATE END :

CALTRANS
Model 170 Controller
Traffic Design Branch
District 7

C8 PROGRAM (Version 4) I. D. No.: 194240

LOCATION: *Pomona Fwy. EB Ramps @ Fullerton Rd.* CO: *LA* RTE: *60* PM : 19.55

CONTROL CODE "F"

PHASE TIMING

	INTERVAL	1	2	3	4	5	6	7	8
0	WALK	0	7	0	7		7		
1	DON'T WALK	0	28	0	15		9		
2	MIN GREEN	8	10	8	8		10		
3	TYPE 3 DET	0	0	0	0		0		
4	ADDED / ACT	0.0	2.5	0.0	2.0		2.5		
5	PASSAGE	1.5	5.0	2.0	4.0		5.0		
6	MAX GAP	1.5	7.5	2.0	6.0		7.5		
7	MIN GAP	1.5	3.5	2.0	2.5		3.5		
8	MAX EXT 1	15	60	15	40		60		
9	MAX EXT 2	15	60	15	40		60		
A	MAX EXT 3								
B									
C	REDUCE BY	0.0	0.2	0.0	0.2		0.2		
D	" EVERY	0.0	1.0	0.0	1.0		1.0		
E	YELLOW	4.1	4.4	4.1	4.1		4.4		
F	ALL RED	1.0	1.0	1.0	1.0		1.0		
DIRECTION		SBLT	NB	WB Driveway	OFF RAMP		SB		
DATE		06 11 15	06 11 15	06 11 15	06 11 15		06 11 15		
BY		AG	AG	AG	AG		AG		

	C		D		E (PRE-EMPT)		FLAGS	F 1	2	3	4	5	6	7	8	
0	GAP SET		TB SEL	1	EV SEL	0	FZ PERMIT	X	X	X	X		X			0
1	MAX SET		TB HR		RR1 CLR	10	RED LOCK									1
2	C - SERV		TB MIN		EVA DLY	0	RED/YEL LOCK									2
3			PED SEL	1	EVA CLR	8	VEH RECALL		X				X			3
4			7W SEL		EVB DLY	0	PED RECALL									4
5			PERM SEL		EVB CLR	8	PED PHASES		X		X		X			5
6					EVC DLY	0	A ARROW									6
7					EVC CLR	8	B ARROW									7
8			OFF SEEK	1	EVD DLY	0	DOUBLE ENTRY									8
9			PORT FLAG	0	EVD CLR	8	MAX 2									9
A	OLA GRN				EV MAX	60	LAG PHASES	OBSERVATION ONLY								A
B	OLB GRN				RR2 CLR	10	RED REST									B
C	OLC GRN				EV CLR TIMER		REST IN WALK									C
D	OLD GRN				EV DLY TIMER		MAX 3									D
E					RR CLR TIMER		YEL START-UP		X				X			E
F	RAM ADD		ONE WAY	0	EV MAX TIMER		FIRST PHASE			X						F

NOTES AND REMARKS :

CONTROL CODE "F"

DATE START:
06/11/15
DATE END :

	0	9
0		CLK RST
9		YEAR
A		MONTH
B		DAY OF MO
C	LONG FAIL	DAY OF WK
D	SHORT FAIL	HOUR
E	MAX-VAR-INIT 20	MINUTE
F	RED REVERT 5.0	SECOND

FILE NAME:

OVERLAP PHASES	
A	
B	
C	
D	

CONTROL CODE "C"

	0		CONTROL PLANS (MAXIMUM OF 9 PLANS) 1	2	3	4	5	6	7	8	9				A	B	Y-CORD "C" C	Y-CORD "D" D	E	F	FLAGS 1	2	3	4	5	6	7	8	
0	LOC ADD 2	CYCLE LENGTH	120	120	120										LOCAL TIMER	MASTER TIMER	RAM TEST		TB TIMR	LAG FREE		X		X		X		X	0
1	MANUAL CP	FZ1 GRN FCTR	14	9	9										FZ1 FO	PERM FZ1	INITIAL FLASH		GAP CP1	LAG CP1	X			X		X		X	1
2	MASTER CP														FZ2 FO		DOWN LOAD		GAP CP2	LAG CP2		X		X		X		X	2
3	CURRENT CP	FZ3 GRN FCTR	15	10	10										FZ3 FO	PERM FZ3	PLAN OVERRIDE 1		GAP CP3	LAG CP3		X		X		X		X	3
4	LAST CP	FZ4 GRN FCTR	30	40	40										FZ4 FO	PERM FZ4	PERM TIME	PERM TIME	GAP CP4	LAG CP4		X		X		X		X	4
5	FLASH	FZ5 GRN FCTR													FZ5 FO	PERM FZ5	LAG OFS	LAG OFS	GAP CP5	LAG CP5		X		X		X		X	5
6	CURRENT OFS														FZ6 FO		FORCE OFF	FORCE OFF	GAP CP6	LAG CP6		X		X		X		X	6
7	TRANS. CP	FZ7 GRN FCTR													FZ7 FO	PERM FZ7	LONG GRN	LONG GRN	GAP CP7	LAG CP7		X		X		X		X	7
8	8 KEY BANK	FZ8 GRN FCTR													FZ8 FO	PERM FZ8	NO GRN	NO GRN	GAP CP8	LAG CP8		X		X		X		X	8
9	9 KEY BANK	MULTI CYCLE															PERM TIMER	PERM TIMER	GAP CP9	LAG CP9		X		X		X		X	9
A		OFFSET A	95	21	30										PRES OFS	DES OFS	YC OFS	YC OFS		YC LAG C									A
B		OFFSET B															OFFSET TIMER	OFFSET TIMER		YC LAG D									B
C		OFFSET C															LAG GRN TIMER	LAG GRN TIMER		COORD FZ		X				X			C
D	MANUAL OFS	FZ3 EXTENSION															FO TIMER	FO TIMER		HOLD	OBSERVATION ONLY								D
E		FZ7 EXTENSION															LONG GRN TIMER	LONG GRN TIMER		NEXT FZ	OBSERVATION ONLY								E
F		OFS INTERRUPT													LOC CYC	MAS CYC	NO GRN TIMER	NO GRN TIMER		FORCE	OBSERVATION ONLY								F

	1	2	3	4	5	6	7	8	9			
DIRECTION OF PROGRESSION	AV	AM	PM									
DATE	03 08 15	08 02 11	08 02 11									
BY	ACG	ACG	ACG									

C T N E T / QUICNET		DATE START:
MASTER LOC.		8/2/2011
LOCAL NO.		
SYSTEM:	LA 60	
MASTER LOC:	WB OFF RAMP	

412 PROM MODULE DIP SWITCH

		OFF	ON
LOCATION	1	X	
	2		X
	3	X	
	4	X	
	5	X	
	6	X	
	7	X	
	8	X	
FEATURE	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
	6	X	
	7	X	
	8	X	

NOTES AND REMARKS :

3/7/2015 Changes

CONTROL CODE "E" (THIS PAGE @ F-C-F = 0)

	E FUNCTION	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	F FUNCTION	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	
0										C. SERV. CODE 4									0
1										C. SERV. CODE 5									1
2										Y CORD RECALL C									2
3										Y CORD RECALL D									3
5										2 PED OUTPUT		X							5
6										6 PED OUTPUT						X			6
7										4 PED OUTPUT				X					7
8										8 PED OUTPUT								X	8
A	OVERLAP "A" NOT									OVERLAP "A" ON									A
B	OVERLAP "B" NOT									OVERLAP "B" ON									B
C	OVERLAP "C" NOT									OVERLAP "C" ON									C
D	OVERLAP "D" NOT									OVERLAP "D" ON									D

NOTES AND REMARKS

(1) RESET F-C-F = 0.

DET. COUNT SAMPLING PERIOD: (F-C-F = 120)	E-1-6	0
CONTROLLING FM FLAG : (F-C-F = 112)	E-6-F	1

CONTROL CODE "D"

		A	B	C	D MAX RECALL	1	2	3	4	5	6	7	8	E MIN RECALL	1	2	3	4	5	6	7	8	F PED RECALL	1	2	3	4	5	6	7	8	
1					CP1									CP1									CP1									1
2					CP2									CP2									CP2									2
3					CP3									CP3									CP3									3
4					CP4									CP4									CP4									4
5					CP5									CP5									CP5									5
6					CP6									CP6									CP6									6
7					CP7									CP7									CP7									7
8					CP8									CP8									CP8									8
9					CP9									CP9									CP9									9
A																							TOD MAX RECALL1									A
B														CALC. PROG. I.D.									TOD MAX RECALL2									B
C														PROG. I.D. (1st 3)																		C
D														PROG.I.D.(Last 3)																		D
E	LAST PWR FAIL	HH	MM	DD										C8 VERSION NUMBER																		E
F	LAST FLASH	HH	MM	DD										LITHIUM BATTERY CONDITION 84=BAD 85=GOOD																		F

DATE START :	08/02/11
DATE END :	

LOCATION: *Pomona Fwy. EB Ramps @ Fullerton Rd.* CO: *LA* RTE: *60* P.M. *19.55*

CONTROL CODE "9" (C-O-9 = 0 OR 1)

	HR (HH)	MIN (MM)	CP	OFS		S 1	M 2	T 3	W 4	T 5	F 6	S 7
0	05	30	2	A	E		X	X	X	X	X	
1	09	30	1	A	E		X	X	X	X	X	
2	14	30	3	A	E		X	X	X	X	X	
3	19	00	1	A	E		X	X	X	X	X	
4	22	00	E		E		X	X	X	X	X	
5	10	00	1	A	E	X						X
6	22	00	E		E	X						X
7					E							
8					E							
9					E							
A					E							
B					E							
C					E							
D					E							
E					E							
F					E							

CONTROL CODE "9" (C-O-9 = 2)

	HR (HH)	MIN (MM)	CP	OFS		S 1	M 2	T 3	W 4	T 5	F 6	S 7
0					E							
1					E							
2					E							
3					E							
4					E							
5					E							
6					E							
7					E							
8					E							
9					E							
A					E							
B					E							
C					E							
D					E							
E					E							
F					E							

NOTES AND REMARKS

CONTROL CODE "7"

	HR (HH)	MIN (MM)	ACT		ON 0	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0												
1												
2				E								
3				E								
4				E								
5				E								
6				E								
7				E								
8				E								
9				E								
A				E								
B				E								
C				E								
D				E								
E				E								
F				E								

ACTIVITY CODES (CONTROL CODE "7")

1 = TYPE OF SIMULTANEOUS PHASE TERMINATION
2 = MAX 2
3 = MAX 3
4 = CONDITIONAL SERVICE (1ST SELECT)
5 = CONDITIONAL SERVICE (2ND SELECT)
6 = ENERGIZE AUXILIARY OUTPUT
7 = ENERGIZE AUXILIARY OUTPUT
8 = ENERGIZE AUXILIARY OUTPUT
9 = MAX RECALL 1
A = TRAFFIC ACTUATED MAX 2 OPERATION
B = MAX RECALL2
C = YELLOW YIELD COORDINATION
D = YELLOW YIELD COORDINATION
E = FREE OPERATION
F = FLASHING OPERATION

DATE START:	09/15/14
DATE END :	

LOCATION: *Pomona Fwy. EB Ramps @ Fullerton Rd.* CO: *LA* RTE: *60* P.M.: *19.55*

CONTROL CODE "D"

	SYSTEM DETECTORS 0		INPUT SLOT	DELAY 1	CARRYOVER 3	INPUT SLOT	DELAY 2	CARRYOVER 4	
0	NO. OF SLAVES	0	I1			J1			0
1			I2U			J2U			1
2			I2L			J2L			2
3			I3U			J3U			3
4			I3L			J3L			4
5			I4			J4			5
6			I5			J5			6
7			I6U			J6U			7
8			I6L			J6L			8
9			I7U			J7U			9
A			I7L			J7L			A
B			I8			J8			B
C			I9U			J9U			C
D			I9L			J9L			D

NOTES AND REMARKS :

DATE START:	08/02/11
DATE END :	

CONTROL CODE "E"

(THIS PAGE @ FCF=123)

	INPUT FILE	C (PHASE DISPLAY)								D (FUNCTION DISPLAY)							
										RL	YL			EX	CO	CA	T3
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
0	I1	*												*	*		
1	I2U		*											*	*		
2	I2L		*											*	*		
3	I3U		*											*	*		
4	I3L		*											*			
5	I4		*													*	*
6	I5			*										*	*		
7	I6U				*									*	*		
8	I6L				*									*	*		
9	I7U				*									*	*		
A	I7L				*									*			
B	I8				*											*	*
C	I9U	*												*	*		
D	I9L			*										*	*		

	INPUT FILE	E (PHASE DISPLAY)								F (FUNCTION DISPLAY)							
										RL	YL			EX	CO	CA	T3
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
0	J1					*								*	*		
1	J2U						*							*	*		
2	J2L						*							*	*		
3	J3U						*							*	*		
4	J3L						*							*			
5	J4						*									*	*
6	J5							*						*	*		
7	J6U								*					*	*		
8	J6L								*					*	*		
9	J7U								*					*	*		
A	J7L								*					*			
B	J8								*							*	*
C	J9U					*								*	*		
D	J9L							*						*	*		

* = Default Settings X = New Settings NOTE: Default settings (*) should remain unless replaced with new settings (X).

LOCATION: *Pomona Fwy. EB Ramps @ Fullerton Rd.* CO: *LA* RTE: *60* P.M.: *19.55*

CONTROL CODE "8": HOLIDAY 1-16 (C-0-8=11)

	DAY (DD)	YEAR (YY)	MONTH (M)		TYPE 1	2	3	4	5	6	7
0				E							
1				E							
2				E							
3				E							
4				E							
5				E							
6				E							
7				E							
8				E							
9				E							
A				E							
B				E							
C				E							
D				E							
E				E							
F				E							

CONTROL CODE "8": HOLIDAY 17-32 (C-0-8=12)

	DAY (DD)	YEAR (YY)	MONTH (M)		TYPE 1	2	3	4	5	6	7
0				E							
1				E							
2				E							
3				E							
4				E							
5				E							
6				E							
7				E							
8				E							
9				E							
A				E							
B				E							
C				E							
D				E							
E				E							
F				E							

CONTROL CODE "9": HOLIDAY EVENT 1-16 (C-0-9=11)

	TIME (HHMM)	CP	OFS		TYPE 1	2	3	4	5	6	7
0				E							
1				E							
2				E							
3				E							
4				E							
5				E							
6				E							
7				E							
8				E							
9				E							
A				E							
B				E							
C				E							
D				E							
E				E							
F				E							

CONTROL CODE "9": HOLIDAY EVENT 17-32(C-0-9=12)

	TIME (HHMM)	CP	OFS		TYPE 1	2	3	4	5	6	7
0				E							
1				E							
2				E							
3				E							
4				E							
5				E							
6				E							
7				E							
8				E							
9				E							
A				E							
B				E							
C				E							
D				E							
E				E							
F				E							

NOTES

DATE START:

DATE END :

Location: Pomona Fwy. WB Ramps @ Nogales St.
System: Nogales
Master At: Here

District: 07
I/C:

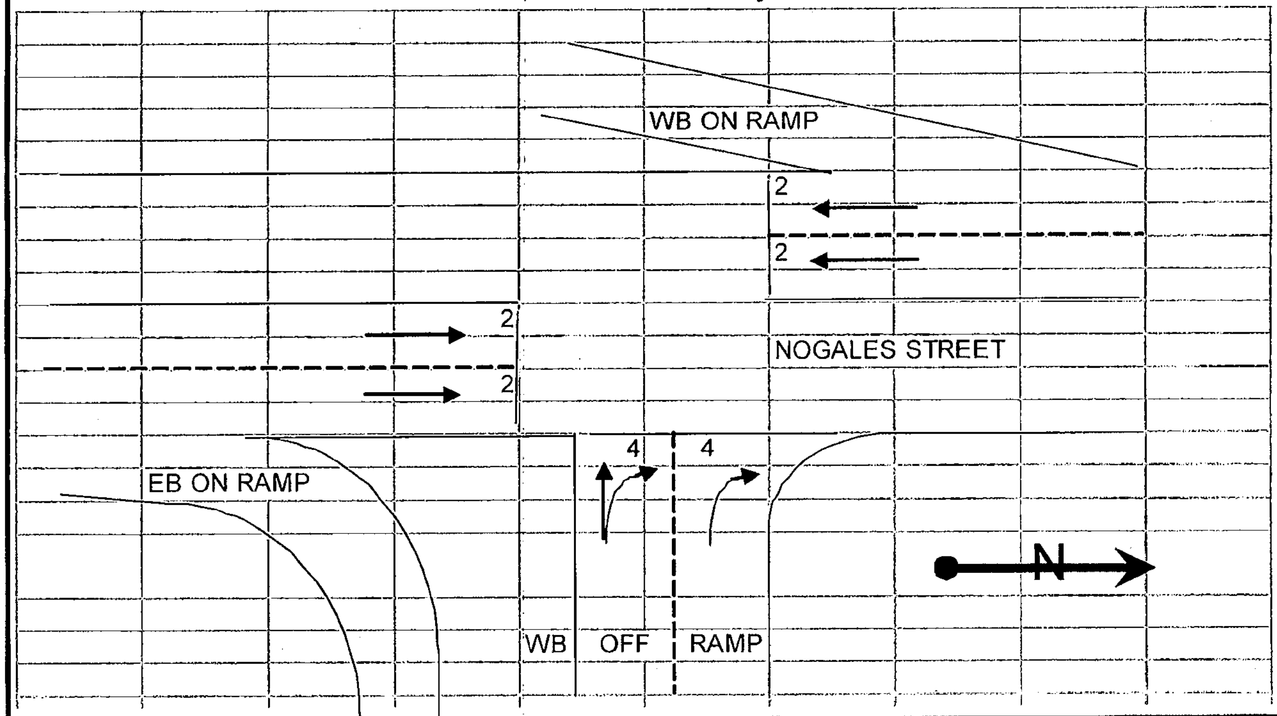
Designed By: ACG
Installed By:
Service Info:

Timing Change:	Date Start:	Date End:	Designed:	Installed:
6/11/2015	5/23/2012		12/17/2009	12/22/2009

PHASE		FLASH
1)		[ ]
2)	NB Nogales St., E-S PED Xing	[ ]
3)		[ ]
4)		[ ]
5)		[ ]
6)	Dummy Phase	[ ]
7)		[ ]
8)	WB Off Ramp	[ ]

OVERLAP		
A)		[ ]
B)		[ ]
C)		[ ]
D)		[ ]
E)		[ ]
F)		[ ]

Intersection Layout



Comments and Notes:

RAM Checksum

Page 2: 72E2	Page 7: D2FD
Page 3: B189	Page 8: 6E4B
Page 4: 1FD0	Page 9: 0ED8
Page 5: C3BC	Page 10: 8D98
Page 6: 8C01	Page 11: C381

Post Mile: 20.45

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CONFIGURATION PHASE FLAGS

Phases (2-1-1-1) *	
Permitted	. 2 . . . 6 . 8
Restricted	. . . .

Phase Recalls (2-1-1-2) *	
Vehicle Min	. 2 . . . 6 . .
Vehicle Max	. . . .
Pedestrian	. 2 . . . . . .
Bicycle	. . . .

Phase Locks (2-1-1-3) *	
Red	 8
Yellow	. 2 . . . 6 . .
Force/Max	. . . .

Phase Features (2-1-1-4)	
Double Entry	. . . .
Rest In Walk	. . . .
Rest In Red	. . . .
Walk 2	. . . .
Max Green 2	. . . .
Max Green 3	. . . .

Startup (2-1-1-5) *	
First Green Phases	. 2 . . . 6 . .
Yellow Start Phases	 8
Yellow Start Overlaps	. . . . . .
Startup All-Red	5.0
Vehicle Calls	. 2 . . . 6 . 8
Pedestrian Calls	. 2 . . . . . .

Call To Phase (2-1-2-1)		Omit On Green	
1	. . . .	1	. . . .
2	. . . .	2	. . . .
3	. . . .	3	. . . .
4	. . . .	4	. . . .
5	. . . .	5	. . . .
6	. . . .	6	. . . .
7	. . . .	7	. . . .
8	. . . .	8	. . . .

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	. . . .
Yellow Flash Overlap	. . . . . .
Flash In Red Phases	. . . .
Flash In Red Overlap	. . . . . .

Special Operation (2-1-2-3)	
Single Exit Phase	. . . .
Driveway Signal Phases	. . . .
Driveway Signal Overlaps	. . . . . .
Leading Ped Phases	. . . .

Protected Permissive (2-1-2-4)	
Protected Permissive	. . . .

Pedestrian (2-1-3) *	
P1	. . . .
P2	. 2 . . . . . .
P3	. . . .
P4	. . . .
P5	. . . .
P6	. . . . . 6 . .
P7	. . . .
P8	. . . .

Overlap (2-1-4)

Overlap	Parent	Omit	No Start	Not
A	. . . .	. . . .	. . . .	. . . .
B	. . . .	. . . .	. . . .	. . . .
C	. . . .	. . . .	. . . .	. . . .
D	. . . .	. . . .	. . . .	. . . .
E	. . . .	. . . .	. . . .	. . . .
F	. . . .	. . . .	. . . .	. . . .

PHASE TIMING

Phase (2-2)	-1-	-2- *	-3-	-4- *	-5-	-6- *	-7-	-8- *
--- Walk 1 ---	0	7	0	0	0	0	0	0
Flash Don't Walk	0	10	0	0	0	0	0	0
Minimum Green	10	10	10	10	10	10	10	10
Det Limit	10	0	10	10	10	0	10	0
Max Initial	10	20	10	10	10	20	10	0
Max Green 1	50	30	50	50	50	30	50	30
Max Green 2	50	30	50	50	50	30	50	30
Max Green 3	50	30	50	50	50	30	50	30
Extension	5.0	4.0	5.0	5.0	5.0	4.0	5.0	4.0
Maximum Gap	5.0	6.0	5.0	5.0	5.0	6.0	5.0	6.0
Minimum Gap	5.0	3.5	5.0	5.0	5.0	3.5	5.0	2.0
Add Per Vehicle	1.0	2.0	1.0	1.0	1.0	2.0	1.0	2.0
Reduce Gap By	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.2
Reduce Every	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Yellow	5.0	4.4	5.0	5.0	5.0	4.4	5.0	4.1
All-Red	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Ped/Bike (2-3)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	0	0	0	0	0	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A	B	C	D	E	F
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert

Red Revert (2-5)	
Time	5.0
Red To Sec (2-6)	
Red To Sec	OFF

COORDINATION

Local Plan (7-1...9) TIMING DATA [Offsets] Green Factors or Press [F] to Select Force-Off

	*	Cycle	Multi	Perm	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 1	Green Factor	90			76				39				39		40
Plan 2	Green Factor	90			78				44				44		35
Plan 3	Green Factor	90			78				46				46		33
Plan 4	Green Factor														
Plan 5	Green Factor														
Plan 6	Green Factor														
Plan 7	Green Factor														
Plan 8	Green Factor														
Plan 9	Green Factor														

Local Plan (7-1...9) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 1	.2.4.6.8	.2...6..	....	....	.2...6..	....	....	....
Plan 2	.2.4.6.8	.2...6..	....	....	.2...6..	....	....	....
Plan 3	.2.4.6.8	.2...6..	....	....	.2...6..	....	....	....
Plan 4	....	....	....	....	....	....	....	....
Plan 5	....	....	....	....	....	....	....	....
Plan 6	....	....	....	....	....	....	....	....
Plan 7	....	....	....	....	....	....	....	....
Plan 8	....	....	....	....	....	....	....	....
Plan 9	....	....	....	....	....	....	....	....

Master Timer Sync (7-A)
Enable in Plans
....

Master Sub Master	
Input	
Output	

FREE PLAN PHASE FLAGS

(7-E) Free	
Lag	Omit
.2.4.6.8	....
Veh Min	Veh Max
.2...6..	....
Ped	Bike
....	....
Cond	Cond Grn
....	10

MANUAL COMMANDS

Manual Plan (4-1)	
Plan	OffSet
	A

Plan: 1-9
15 or 254 = Flash
14 or 255 = Free
Offset A, B, or C

Special Function Override (4-2)			
#	Control	#	Control
1	NORMAL	3	NORMAL
2	NORMAL	4	NORMAL

Detector Reset	(4-3)
Local Manual (4-4)	OFF

DETECTORS

Detector Attributes (5-1) *

Det	Type	Phases	Lock	Slot
1	COUNT+CALL+EXTEND	.2......	NO	I2U
2	COUNT+CALL+EXTEND	.2......	NO	J2U
3	COUNT+CALL+EXTEND	...4....	NO	I6U
4	COUNT+CALL+EXTEND	8	NO	J6U
5	COUNT+CALL+EXTEND	.2......	NO	I2L
6	COUNT+CALL+EXTEND	.2......	NO	J2L
7	COUNT+CALL+EXTEND	...4....	NO	I6L
8	COUNT+CALL+EXTEND	8	NO	J6L
9	LIMITED	.2......	NO	I4
10	LIMITED	.....6..	NO	J4
11	LIMITED	...4....	NO	I8
12	LIMITED	8	NO	J8
13	COUNT+CALL+EXTEND	....5...	NO	J1
14	COUNT+CALL+EXTEND	1.......	NO	I1
15	COUNT+CALL+EXTEND	......7.	NO	J5
16	COUNT+CALL+EXTEND	..3.....	NO	I5
17	COUNT+CALL+EXTEND	....5...	NO	J9U
18	COUNT+CALL+EXTEND	1.......	NO	I9U
19	COUNT+CALL+EXTEND	......7.	NO	J9L
20	COUNT+CALL+EXTEND	..3.....	NO	I9L
21	CALL+EXTEND	.2......	NO	I3L
22	CALL+EXTEND	.....6..	NO	J3L
23	CALL+EXTEND	...4....	NO	I7L
24	CALL+EXTEND	8	NO	J7L
25	COUNT+CALL+EXTEND	.2......	NO	I3U
26	COUNT+CALL+EXTEND	.....6..	NO	J3U
27	COUNT+CALL+EXTEND	...4....	NO	I7U
28	COUNT+CALL+EXTEND	8	NO	J7U
29	PEDESTRIAN	.2......	NO	I 12U
30	PEDESTRIAN	.....6..	NO	I 13U
31	PEDESTRIAN	...4....	NO	I 12L
32	PEDESTRIAN	8	NO	I 13L

Detector Configuration (5-2)

Det	Delay	Extend	Recall	Port
1			10	1.1
2			10	1.2
3			10	1.3
4			10	1.4
5			10	1.5
6			10	1.6
7			10	1.7
8			10	1.8
9			10	2.1
10			10	2.2
11			10	2.3
12			10	2.4
13			10	3.1
14			10	3.2
15			10	3.3
16			10	3.4
17			10	3.5
18			10	3.6
19			10	3.7
20			10	3.8
21			10	6.2
22			10	6.3
23			10	6.4
24			10	6.5
25			10	4.5
26			10	4.6
27			10	4.7
28			10	4.8
29			10	5.1
30			10	5.2
31			10	5.3
32			10	5.4

Failure Times(5-3)	Minutes
Maximum On Time	
Fail Reset Time	

Failure Override (5-4)	
Detectors 1-8	....
Detectors 9-16	....
Detectors 17-24	....
Detectors 25-32	....

System Detector Assignment (5-5)

Sys Det	1	2	3	4	5	6	7	8
Det Num								
Sys Det	9	10	11	12	13	14	15	16
Det Num								

CIC Operation (5-6-1)	
Enable in Plans	....

CIC Values (5-6-2)	Volume	Occupancy	Demand
Smoothing	0.66	0.66	0.66
Multiplier	4.0	0.33	
Exponent	0.50	1.00	

Detector-to-Phase Assignment (5-6-3)

Sys Det	1	2	3	4	5	6	7	8
Phase								
Sys Det	9	10	11	12	13	14	15	16
Phase								

Input File Port-Bit Assignments

332 Cabinet - For Reference Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I-	3.2	1.1	4.5	2.1	3.4	1.3	4.7	2.3	3.6		6.6	5.1	5.2	6.7
		1.5	6.2			1.7	6.4		3.8		2.7	5.3	5.4	6.8
J-	3.1	1.2	4.6	2.2	3.3	1.4	4.8	2.4	3.5		2.8	5.5	5.6	2.5
		1.6	6.3			1.8	6.5		3.7		6.1	5.7	5.8	2.6

TOD SCHEDULE

Table 1 (8-2-1)		*
Time	Plan	OS
0545	1	A
0900	2	A
1500	3	A
1900	2	A
2100	255	A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 2 (8-2-2)		*
Time	Plan	OS
0900	2	A
2100	255	A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 3 (8-2-3)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 4 (8-2-4)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 5 (8-2-5)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 6 (8-2-6)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

WEEKDAY ASSIGNMENT

HOLIDAY TABLES

TOD FUNCTIONS

TOD Functions (8-3)					
#	Start	End	DOW	Action	Phases
1			....		....
2			....		....
3			....		....
4			....		....
5			....		....
6			....		....
7			....		....
8			....		....
9			....		....
10			....		....
11			....		....
12			....		....
13			....		....
14			....		....
15			....		....
16			....		....

Action Codes:
0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11.Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped
41. Protected Permissive
42. Protected Permissive

Action Code = Phases added to normal setting
100+Action Code = Phases removed
200+Action Code = Phases replaced

COMMUNICATIONS

C2 (6-1-1)	*
Address	1
Protocol	AB3418
Limit Access	
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

C20 (6-1-2)	
Address	
Protocol	AB3418
Limit Access	
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

C21 (6-1-3)	
Address	
Protocol	AB3418
Limit Access	
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

Limit Access:
0-None
1-Status Only
2-Status, Set Pattern, Time
3-Status, Set Pattern, Time, Manual Plan

SOFT LOGIC

Soft Logic (6-2)							
#	Data	OP	Data	OP	Data	OP	Data
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

*Refer to User's Manual for Data and OP Codes

CALLBACK NUMBERS

Callback Numbers (6-3...3)	
Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

RAILROAD PREEMPTION

RR 1

(3-1-1)	Timing	Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
Delay		Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
Clear1	10	.2..5...	....	....	....	....	.2.4.6.8	......	......	......
Clear 2		....	....	....	....	....	....	......	......	......
Clear 3		....	....	....	....	....	....	......	......	......
Hold		....	....	12345678	....	....	....	......	......	ABCDEF
Exit	5									
Min Grn										
Ped Clr										

Exit Parameters (3-1-5)			
Phase Green	Overlap Green	Vehicle Recall	Ped Call
....	......	12345678	.2.4.6.8

Configuration (3-1-6)		
Port	Latching	Power-Up
2.5	YES	FLASHING

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)	Preempt Timers			Phase Green	Overlap Green
	Delay	Clear	Max		
		30	30	.2..5...	......

Port	Latching	Phase Termination
5.5	NO	ADVANCE

EVB (3-B)	Preempt Timers			Phase Green	Overlap Green
	Delay	Clear	Max		
		30	30	...4..7.	......

Port	Latching	Phase Termination
5.6	NO	ADVANCE

EVC (3-C)	Preempt Timers			Phase Green	Overlap Green
	Delay	Clear	Max		
		30	30	1....6..	......

Port	Latching	Phase Termination
5.7	NO	ADVANCE

EVD (3-D)	Preempt Timers			Phase Green	Overlap Green
	Delay	Clear	Max		
		30	30	..3....8	......

Port	Latching	Phase Termination
5.8	NO	ADVANCE

INPUTS

		7 Wire I/C (2-1-5-1)			
		Input	Port	Input	Port
Enable	NO	R1	3.8	Free	3.6
Max ON		R2	3.5	D2	2.8
Max OFF		R3	3.7	D3	6.1

Manual Control (2-1-5-2)	
Input	Port
Manual Advance	6.6
Advance Enable	6.6

Cabinet Status (2-1-5-3)	
Input	Port
Flash Bus	
Door Ajar	
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	
2	
3	
4	

Battery Backup (2-1-5-5)	
Port	Operation
	NORMAL

Y-Coordination (2-1-5-6)	
Port C	Port D
6.1	2.8

OUTPUTS

Loadswitch Assignments (2-1-6)							+
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:
- 0 Unused (no output)
- 1-8 Vehicle 1-8
- 9-14 Overlap A-F
- 21-28 Ped 1-8
- 41-47 Special Functions
- 41 Protected Permissive Flashing Phase 1
- 43 Protected Permissive Flashing Phase 3
- 45 Protected Permissive Flashing Phase 5
- 47 Protected Permissive Flashing Phase 7
- 51-57 Special Functions
- 71-72 Seven Wire I/C

+ middle output of loadswitches 3 and 6
Channel 9 and 10

YELLOW YIELD COOORDINATION

					Force-Offs											
Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	Coord	Lag	Min Recall	Restricted
Plan C													.2...6..	.2.4.6.8	....	....
Plan D													.2...6..	.2.4.6.8	....	....

TRANSIT PRIORITY

Local Plans (3-E1...9)		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor											
Plan 2	Green Factor											
Plan 3	Green Factor											
Plan 4	Green Factor											
Plan 5	Green Factor											
Plan 6	Green Factor											
Plan 7	Green Factor											
Plan 8	Green Factor											
Plan 9	Green Factor											

Enable Priority (3-E-A)	
Enable in Plan	....

Free Plans (3-E-E)	
Max Green Hold	Hold Phase
	....

Access Utilities (9-5)	
Password	***
Timeout	

TRUCK PREEMPTION

Truck Preemption (3-F)	Passage	CarryOver	Clearance	Next Preempt	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output

Department of Transportation, California Caltrans 2070 Controller Timing Chart TSCP 2.12 PAGE 1

Location: Pomona Fwy. EB Ramps @ Nogales St.		Designed By: ACG
System: Nogales	District: 07	Installed By:
Master At: WB Off Ramp	I/C:	Service Info:

Timing Change:	Date Start:	Date End:	Designed:	Installed:
6/11/2015	5/23/2012		12/17/2009	12/22/2009

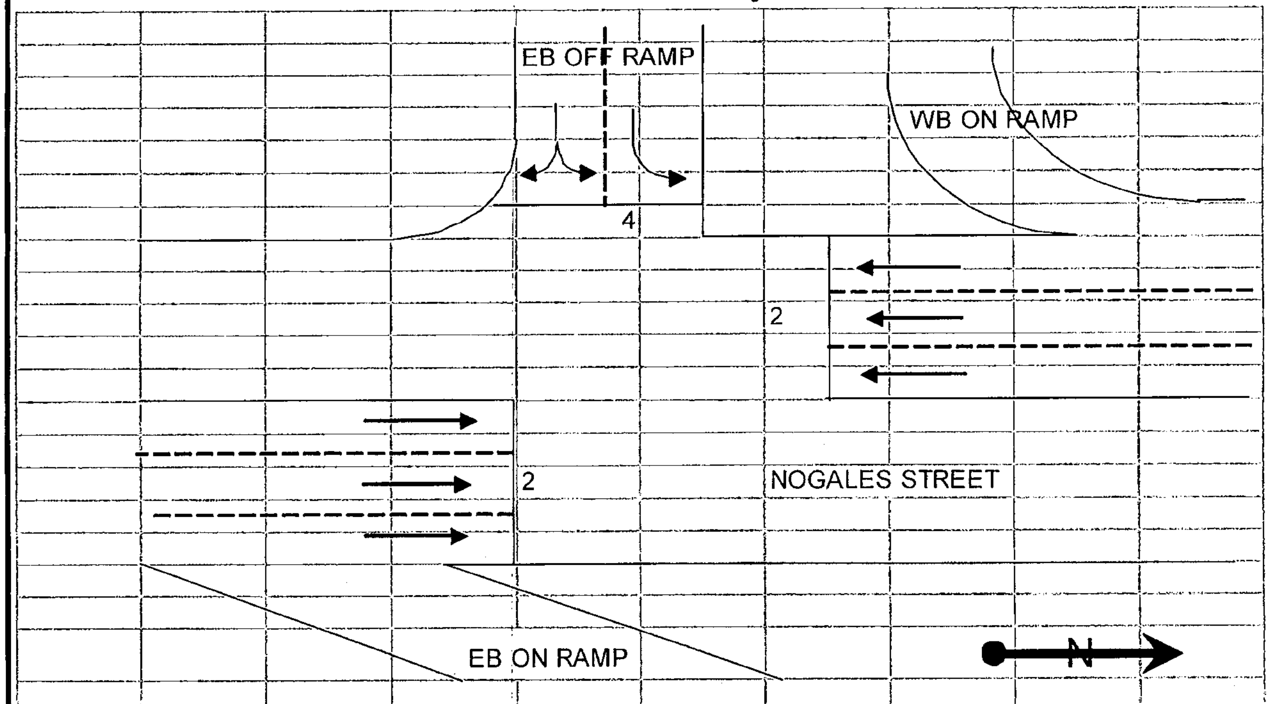
PHASE

		FLASH
1)		[ ]
2)	NB & SB Nogales St., E-S & W-S Ped.	[ ]
3)		[ ]
4)	EB Off Ramp	[ ]
5)		[ ]
6)	Dummy	[ ]
7)		[ ]
8)		[ ]

OVERLAP

A)		[ ]
B)		[ ]
C)		[ ]
D)		[ ]
E)		[ ]
F)		[ ]

Intersection Layout



Comments and Notes:

RAM Checksum

Page 2:	7597	Page 7:	D2FD
Page 3:	DFE9	Page 8:	A12B
Page 4:	E596	Page 9:	0ED8
Page 5:	D716	Page 10:	8D98
Page 6:	8C01	Page 11:	C381

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CONFIGURATION PHASE FLAGS

Phases (2-1-1-1) *	
Permitted	. 2 . 4 . 6 . .
Restricted	. . . .

Phase Recalls (2-1-1-2) *	
Vehicle Min	. 2 . . . 6 . .
Vehicle Max	. . . .
Pedestrian	. 2 . . . . . .
Bicycle	. . . .

Phase Locks (2-1-1-3) *	
Red	. . . 4 . . . .
Yellow	. 2 . . . 6 . .
Force/Max	. . . .

Phase Features (2-1-1-4)	
Double Entry	. . . .
Rest In Walk	. . . .
Rest In Red	. . . .
Walk 2	. . . .
Max Green 2	. . . .
Max Green 3	. . . .

Startup (2-1-1-5) *	
First Green Phases	. 2 . . . 6 . .
Yellow Start Phases	. . . 4 . . . .
Yellow Start Overlaps	. . . . . .
Startup All-Red	5.0
Vehicle Calls	. 2 . 4 . 6 . .
Pedestrian Calls	. 2 . 4 . 6 . .

Call To Phase (2-1-2-1)		Omit On Green	
1	. . . .	1	. . . .
2	. . . .	2	. . . .
3	. . . .	3	. . . .
4	. . . .	4	. . . .
5	. . . .	5	. . . .
6	. . . .	6	. . . .
7	. . . .	7	. . . .
8	. . . .	8	. . . .

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	. . . .
Yellow Flash Overlap	. . . . . .
Flash In Red Phases	. . . .
Flash In Red Overlap	. . . . . .

Special Operation (2-1-2-3)	
Single Exit Phase	. . . .
Driveway Signal Phases	. . . .
Driveway Signal Overlaps	. . . . . .
Leading Ped Phases	. . . .

Protected Permissive (2-1-2-4)	
Protected Permissive	. . . .

Pedestrian (2-1-3) *	
P1	. . . .
P2	. 2 . . . . . .
P3	. . . .
P4	. . . .
P5	. . . .
P6	. . . . . 6 . .
P7	. . . .
P8	. . . .

Overlap (2-1-4)

Overlap	Parent	Omit	No Start	Not
A	. . . .	. . . .	. . . .	. . . .
B	. . . .	. . . .	. . . .	. . . .
C	. . . .	. . . .	. . . .	. . . .
D	. . . .	. . . .	. . . .	. . . .
E	. . . .	. . . .	. . . .	. . . .
F	. . . .	. . . .	. . . .	. . . .

PHASE TIMING

Phase (2-2)	-1-	-2- *	-3-	-4- *	-5-	-6- *	-7-	-8-
--- Walk 1 ---	0	7	0	0	0	0	0	10
Flash Don't Walk	0	10	0	0	0	0	0	10
Minimum Green	10	10	10	10	10	10	10	10
Det Limit	10	0	10	0	10	0	10	10
Max Initial	10	20	10	0	10	20	10	10
Max Green 1	50	30	50	30	50	30	50	50
Max Green 2	50	30	50	30	50	30	50	50
Max Green 3	50	30	50	30	50	30	50	50
Extension	5.0	4.0	5.0	4.0	5.0	4.0	5.0	5.0
Maximum Gap	5.0	6.0	5.0	4.0	5.0	6.0	5.0	5.0
Minimum Gap	5.0	3.5	5.0	4.0	5.0	3.5	5.0	5.0
Add Per Vehicle	1.0	2.0	1.0	0.0	1.0	2.0	1.0	1.0
Reduce Gap By	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0
Reduce Every	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0
Yellow	5.0	4.4	5.0	4.1	5.0	4.4	5.0	5.0
All-Red	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Ped/Bike (2-3)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	0	0	0	0	0	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A	B	C	D	E	F
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert

Red Revert (2-5)	
Time	5.0
Red To Sec (2-6)	
Red To Sec	OFF

COORDINATION

Local Plan (7-1...9) TIMING DATA [Offsets] Green Factors or Press [F] to Select Force-Off

	*	Cycle	Multi	Perm	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 1	Green Factor	90							45		33		45		
Plan 2	Green Factor	90							48		30		48		
Plan 3	Green Factor	90							40		38		40		
Plan 4	Green Factor														
Plan 5	Green Factor														
Plan 6	Green Factor														
Plan 7	Green Factor														
Plan 8	Green Factor														
Plan 9	Green Factor														

Local Plan (7-1...9) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 1	.2.4.6.8	.2...6..	....	....	....	....	....	....
Plan 2	.2.4.6.8	.2...6..	....	....	....	....	....	....
Plan 3	.2.4.6.8	.2...6..	....	....	....	....	....	....
Plan 4	....	....	....	....	....	....	....	....
Plan 5	....	....	....	....	....	....	....	....
Plan 6	....	....	....	....	....	....	....	....
Plan 7	....	....	....	....	....	....	....	....
Plan 8	....	....	....	....	....	....	....	....
Plan 9	....	....	....	....	....	....	....	....

Master Timer Sync (7-A)
Enable in Plans
....

Master Sub Master	
Input	
Output	

FREE PLAN PHASE FLAGS

(7-E) Free	
Lag	Omit
.2.4.6.8	....
Veh Min	Veh Max
.2...6..	....
Ped	Bike
....	....
Cond	Cond Grn
....	10

MANUAL COMMANDS

Manual Plan (4-1)	
Plan	OffSet
	A

Plan: 1-9
15 or 254 = Flash
14 or 255 = Free
Offset A, B, or C

Special Function Override (4-2)			
#	Control	#	Control
1	NORMAL	3	NORMAL
2	NORMAL	4	NORMAL

Detector Reset	(4-3)
Local Manual (4-4)	OFF

DETECTORS

Detector Attributes (5-1)				Slot	Detector Configuration (5-2)				
Det	Type	Phases	Lock		Det	Delay	Extend	Recall	Port
1	COUNT+CALL+EXTEND	.2......	NO	I2U	1			10	1.1
2	COUNT+CALL+EXTEND	.....6..	NO	J2U	2			10	1.2
3	COUNT+CALL+EXTEND	...4....	NO	I6U	3			10	1.3
4	COUNT+CALL+EXTEND	8	NO	J6U	4			10	1.4
5	COUNT+CALL+EXTEND	.2......	NO	I2L	5			10	1.5
6	COUNT+CALL+EXTEND	.....6..	NO	J2L	6			10	1.6
7	COUNT+CALL+EXTEND	...4....	NO	I6L	7			10	1.7
8	COUNT+CALL+EXTEND	8	NO	J6L	8			10	1.8
9	LIMITED	.2......	NO	I4	9			10	2.1
10	LIMITED	.....6..	NO	J4	10			10	2.2
11	LIMITED	...4....	NO	I8	11			10	2.3
12	LIMITED	8	NO	J8	12			10	2.4
13	COUNT+CALL+EXTEND	....5...	NO	J1	13			10	3.1
14	COUNT+CALL+EXTEND	1.......	NO	I1	14			10	3.2
15	COUNT+CALL+EXTEND	......7.	NO	J5	15			10	3.3
16	COUNT+CALL+EXTEND	..3.....	NO	I5	16			10	3.4
17	COUNT+CALL+EXTEND	....5...	NO	J9U	17			10	3.5
18	COUNT+CALL+EXTEND	1.......	NO	I9U	18			10	3.6
19	COUNT+CALL+EXTEND	......7.	NO	J9L	19			10	3.7
20	COUNT+CALL+EXTEND	..3.....	NO	I9L	20			10	3.8
21	CALL+EXTEND	.2......	NO	I3L	21			10	6.2
22	CALL+EXTEND	.....6..	NO	J3L	22			10	6.3
23	CALL+EXTEND	...4....	NO	I7L	23			10	6.4
24	CALL+EXTEND	8	NO	J7L	24			10	6.5
25	COUNT+CALL+EXTEND	.2......	NO	I3U	25			10	4.5
26	COUNT+CALL+EXTEND	.....6..	NO	J3U	26			10	4.6
27	COUNT+CALL+EXTEND	...4....	NO	I7U	27			10	4.7
28	COUNT+CALL+EXTEND	8	NO	J7U	28			10	4.8
29	PEDESTRIAN	.2......	NO	I 12U	29			10	5.1
30	PEDESTRIAN	.....6..	NO	I 13U	30			10	5.2
31	PEDESTRIAN	...4....	NO	I 12L	31			10	5.3
32	PEDESTRIAN	8	NO	I 13L	32			10	5.4

Failure Times(5-3)	Minutes
Maximum On Time	
Fail Reset Time	

Failure Override (5-4)	
Detectors 1-8	....
Detectors 9-16	....
Detectors 17-24	....
Detectors 25-32	....

System Detector Assignment (5-5)

Sys Det	1	2	3	4	5	6	7	8
Det Num								
Sys Det	9	10	11	12	13	14	15	16
Det Num								

CIC Operation (5-6-1)	
Enable in Plans	....

CIC Values (5-6-2)	Volume	Occupancy	Demand
Smoothing	0.66	0.66	0.66
Multiplier	4.0	0.33	
Exponent	0.50	1.00	

Detector-to-Phase Assignment (5-6-3)

Sys Det	1	2	3	4	5	6	7	8
Phase								
Sys Det	9	10	11	12	13	14	15	16
Phase								

Input File Port-Bit Assignments

332 Cabinet - For Reference Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I-	3.2	1.1	4.5	2.1	3.4	1.3	4.7	2.3	3.6		6.6	5.1	5.2	6.7
		1.5	6.2			1.7	6.4		3.8		2.7	5.3	5.4	6.8
J-	3.1	1.2	4.6	2.2	3.3	1.4	4.8	2.4	3.5		2.8	5.5	5.6	2.5
		1.6	6.3			1.8	6.5		3.7		6.1	5.7	5.8	2.6

TOD SCHEDULE

Table 1 (8-2-1)		*
Time	Plan	OS
0545	1	A
0900	2	A
1500	3	A
1900	2	A
2100	255	A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 2 (8-2-2)		*
Time	Plan	OS
0900	2	A
2100	255	A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 3 (8-2-3)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 4 (8-2-4)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 5 (8-2-5)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 6 (8-2-6)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

WEEKDAY ASSIGNMENT

HOLIDAY TABLES

TOD FUNCTIONS

TOD Functions (8-3)

#	Start	End	DOW	Action	Phases
1			....		....
2			....		....
3			....		....
4			....		....
5			....		....
6			....		....
7			....		....
8			....		....
9			....		....
10			....		....
11			....		....
12			....		....
13			....		....
14			....		....
15			....		....
16			....		....

Action Codes:
0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11.Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped
41. Protected Permissive
42. Protected Permissive

Action Code = Phases added to normal setting
100+Action Code = Phases removed
200+Action Code = Phases replaced

COMMUNICATIONS

C2 (6-1-1)	*
Address	2
Protocol	AB3418
Limit Access	
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

C20 (6-1-2)	
Address	
Protocol	AB3418
Limit Access	
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

C21 (6-1-3)	
Address	
Protocol	AB3418
Limit Access	
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

Limit Access:
0-None
1-Status Only
2-Status, Set Pattern, Time
3-Status, Set Pattern, Time, Manual Plan

SOFT LOGIC

Soft Logic (6-2)							
#	Data	OP	Data	OP	Data	OP	Data
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

*Refer to User's Manual for Data and OP Codes

CALLBACK NUMBERS

Callback Numbers (6-3...3)	
Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

RAILROAD PREEMPTION

RR 1

(3-1-1)	Timing	Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
Delay		Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
Clear1	10	.2..5...	....	....	....	....	.2.4.6.8	......	......	......
Clear 2		....	....	....	....	....	....	......	......	......
Clear 3		....	....	....	....	....	....	......	......	......
Hold		....	....	12345678	....	....	....	......	......	ABCDEF
Exit	5									
Min Grn										
Ped Clr										

Exit Parameters (3-1-5)			
Phase Green	Overlap Green	Vehicle Recall	Ped Call
....	......	12345678	.2.4.6.8

Configuration (3-1-6)		
Port	Latching	Power-Up
2.5	YES	FLASHING

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)	Preempt Timers			Phase Green	Overlap Green
	Delay	Clear	Max		
		30	30	.2..5...	......

Port	Latching	Phase Termination
5.5	NO	ADVANCE

EVB (3-B)	Preempt Timers			Phase Green	Overlap Green
	Delay	Clear	Max		
		30	30	...4..7.	......

Port	Latching	Phase Termination
5.6	NO	ADVANCE

EVC (3-C)	Preempt Timers			Phase Green	Overlap Green
	Delay	Clear	Max		
		30	30	1....6..	......

Port	Latching	Phase Termination
5.7	NO	ADVANCE

EVD (3-D)	Preempt Timers			Phase Green	Overlap Green
	Delay	Clear	Max		
		30	30	..3....8	......

Port	Latching	Phase Termination
5.8	NO	ADVANCE

INPUTS

		7 Wire I/C (2-1-5-1)			
		Input	Port	Input	Port
Enable	NO	R1	3.8	Free	3.6
Max ON		R2	3.5	D2	2.8
Max OFF		R3	3.7	D3	6.1

Manual Control (2-1-5-2)	
Input	Port
Manual Advance	6.6
Advance Enable	6.6

Battery Backup (2-1-5-5)	
Port	Operation
	NORMAL

Cabinet Status (2-1-5-3)	
Input	Port
Flash Bus	
Door Ajar	
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	
2	
3	
4	

Y-Coordination (2-1-5-6)	
Port C	Port D
6.1	2.8

OUTPUTS

Loadswitch Assignments (2-1-6)						+	
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:
- 0 Unused (no output)
- 1-8 Vehicle 1-8
- 9-14 Overlap A-F
- 21-28 Ped 1-8
- 41-47 Special Functions
- 41 Protected Permissive Flashing Phase 1
- 43 Protected Permissive Flashing Phase 3
- 45 Protected Permissive Flashing Phase 5
- 47 Protected Permissive Flashing Phase 7
- 51-57 Special Functions
- 71-72 Seven Wire I/C

+ middle output of loadswitches 3 and 6 Channel 9 and 10

YELLOW YIELD COOORDINATION

					Force-Offs											
Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	Coord	Lag	Min Recall	Restricted
Plan C													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . .	. . . .
Plan D													. 2 . . . 6 . .	. 2 . 4 . 6 . 8	. . . .	. . . .

TRANSIT PRIORITY

Local Plans (3-E1...9)		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor											
Plan 2	Green Factor											
Plan 3	Green Factor											
Plan 4	Green Factor											
Plan 5	Green Factor											
Plan 6	Green Factor											
Plan 7	Green Factor											
Plan 8	Green Factor											
Plan 9	Green Factor											

Enable Priority (3-E-A)	
Enable In Plan	. . . .

Free Plans (3-E-E)	
Max Green Hold	Hold Phase
	. . . .

Access Utilities (9-5)	
Password	***
Timeout	

TRUCK PREEMPTION

Truck Preemption (3-F)	Passage	CarryOver	Clearance	Next Preempt	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway WB Off-Ramp (EW) - #2
Morning Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.54	0.54	0.54
Effective Green Time	54	54	54
Traffic Volume - With PHF	391	0	573
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	4.9	#DIV/0!	6.9
Peak 15 Minutes - Total	7.4	#DIV/0!	10.3

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	4.9	#DIV/0!	6.9
	Peak 15 Minutes - Total	7.4	#DIV/0!	10.3
70%	Peak 15 Minutes - Per Lane	6.7	#DIV/0!	9.1
	Peak 15 Minutes - Total	9.6	#DIV/0!	13.2
85%	Peak 15 Minutes - Per Lane	7.6	#DIV/0!	10.3
	Peak 15 Minutes - Total	10.9	#DIV/0!	14.9
90%	Peak 15 Minutes - Per Lane	8.1	#DIV/0!	11.0
	Peak 15 Minutes - Total	11.7	#DIV/0!	16.0
95%	Peak 15 Minutes - Per Lane	8.5	#DIV/0!	11.5
	Peak 15 Minutes - Total	12.3	#DIV/0!	16.8
98%	Peak 15 Minutes - Per Lane	9.3	#DIV/0!	12.7
	Peak 15 Minutes - Total	13.5	#DIV/0!	18.5

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	391
	Input	Item	Description		
	391	vi	lane group flow rate including initial queue present		
	391	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	260.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	260.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	4.903539701
	Input	Item	Description		
	4.903539701	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	4.832809636	Q1	first-term queued vehicles (vehicles)		
	0.070730065	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	4.832809636
	Input	Item	Description		
	4.832809636	Q1	first-term queued vehicles (vehicles)		
	1.202306148	PF2	adjustment factor for effects of progression		
	260.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.317367554	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.202306148
	Input	Item	Description		
	1.202306148	PF2	adjustment factor for effects of progression		
	260.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.070730065
	Input	Item	Description		
	0.070730065	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.317367554	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C)))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.12I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	573
	Input	Item	Description		
	573	vi	lane group flow rate including initial queue present		
	573	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	382
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	382	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	6.877044055
	Input	Item	Description		
	6.877044055	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	6.773391044	Q1	first-term queued vehicles (vehicles)		
	0.103653011	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C)))/(1-(min(1.0,XL)(g/C)))		Equation	Results	6.773391044
	Input	Item	Description		
	6.773391044	Q1	first-term queued vehicles (vehicles)		
	1.039158909	PF2	adjustment factor for effects of progression		
	382	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.465093627	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.039158909
	Input	Item	Description		
	1.039158909	PF2	adjustment factor for effects of progression		
	382	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.103653011
	Input	Item	Description		
	0.103653011	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.465093627	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.12I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway WB Off-Ramp (EW) - #2
Evening Peak Hour

Description	Queue Analysis Left	Queue Analysis Thru	Queue Analysis Right
Lanes	1.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.54	0.54	0.54
Effective Green Time	54	54	54
Traffic Volume - With PHF	368	0	334
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	4.6	#DIV/0!	4.2
Peak 15 Minutes - Total	7.0	#DIV/0!	6.4

Description		Left Turn Total Queue Analysis Northbound	Left Turn Total Queue Analysis Southbound	Left Turn Total Queue Analysis Westbound
50%	Peak 15 Minutes - Per Lane	4.6	#DIV/0!	4.2
	Peak 15 Minutes - Total	7.0	#DIV/0!	6.4
70%	Peak 15 Minutes - Per Lane	6.4	#DIV/0!	5.9
	Peak 15 Minutes - Total	9.1	#DIV/0!	8.4
85%	Peak 15 Minutes - Per Lane	7.2	#DIV/0!	6.7
	Peak 15 Minutes - Total	10.4	#DIV/0!	9.6
90%	Peak 15 Minutes - Per Lane	7.7	#DIV/0!	7.2
	Peak 15 Minutes - Total	11.1	#DIV/0!	10.3
95%	Peak 15 Minutes - Per Lane	8.1	#DIV/0!	7.5
	Peak 15 Minutes - Total	11.7	#DIV/0!	10.7
98%	Peak 15 Minutes - Per Lane	8.9	#DIV/0!	8.2
	Peak 15 Minutes - Total	12.8	#DIV/0!	11.8

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3860)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3860)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	368
	Input	Item	Description		
	368	vi	lane group flow rate including initial queue present		
	368	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	245.3333333
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	245.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	4.64017196
	Input	Item	Description		
	4.64017196	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	4.573602487	Q1	first-term queued vehicles (vehicles)		
	0.066569473	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	4.573602487
	Input	Item	Description		
	4.573602487	Q1	first-term queued vehicles (vehicles)		
	1.223642403	PF2	adjustment factor for effects of progression		
	245.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.298698874	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.223642403
	Input	Item	Description		
	1.223642403	PF2	adjustment factor for effects of progression		
	245.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.066569473
	Input	Item	Description		
	0.066569473	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.298698874	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3860)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3860)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.10I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	334
	Input	Item	Description		
	334	vl	lane group flow rate including initial queue present		
	334	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	222.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	222.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	4.245104141
	Input	Item	Description		
	4.245104141	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	4.184685108	Q1	first-term queued vehicles (vehicles)		
	0.060419033	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	4.184685108
	Input	Item	Description		
	4.184685108	Q1	first-term queued vehicles (vehicles)		
	1.255478379	PF2	adjustment factor for effects of progression		
	222.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.271101696	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.255478379
	Input	Item	Description		
	1.255478379	PF2	adjustment factor for effects of progression		
	222.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.060419033
	Input	Item	Description		
	0.060419033	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.271101696	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.10I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway WB Off-Ramp (EW) - #2
Saturday Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.54	0.54	0.54
Effective Green Time	54	54	54
Traffic Volume - With PHF	549	0	494
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	6.6	#DIV/0!	6.0
Peak 15 Minutes - Total	9.9	#DIV/0!	9.1

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	6.6	#DIV/0!	6.0
	Peak 15 Minutes - Total	9.9	#DIV/0!	9.1
70%	Peak 15 Minutes - Per Lane	8.8	#DIV/0!	8.1
	Peak 15 Minutes - Total	12.7	#DIV/0!	11.7
85%	Peak 15 Minutes - Per Lane	9.9	#DIV/0!	9.1
	Peak 15 Minutes - Total	14.4	#DIV/0!	13.2
90%	Peak 15 Minutes - Per Lane	10.6	#DIV/0!	9.8
	Peak 15 Minutes - Total	15.5	#DIV/0!	14.2
95%	Peak 15 Minutes - Per Lane	11.1	#DIV/0!	10.3
	Peak 15 Minutes - Total	16.2	#DIV/0!	14.9
98%	Peak 15 Minutes - Per Lane	12.3	#DIV/0!	11.3
	Peak 15 Minutes - Total	17.9	#DIV/0!	16.4

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	549
	Input	Item	Description		
	549	vl	lane group flow rate including initial queue present		
	549	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	366
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	366	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	6.628036047
	Input	Item	Description		
	6.628036047	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	6.528724523	Q1	first-term queued vehicles (vehicles)		
	0.099311524	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	6.528724523
	Input	Item	Description		
	6.528724523	Q1	first-term queued vehicles (vehicles)		
	1.060094785	PF2	adjustment factor for effects of progression		
	366	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.445613266	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.060094785
	Input	Item	Description		
	1.060094785	PF2	adjustment factor for effects of progression		
	366	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.099311524
	Input	Item	Description		
	0.099311524	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.445613266	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3600)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3600)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	494
	Input	Item	Description		
	494	vl	lane group flow rate including initial queue present		
	494	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	329.3333333
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	329.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	6.044520032
	Input	Item	Description		
	6.044520032	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.95515775	Q1	first-term queued vehicles (vehicles)		
	0.089362282	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.95515775
	Input	Item	Description		
	5.95515775	Q1	first-term queued vehicles (vehicles)		
	1.108735178	PF2	adjustment factor for effects of progression		
	329.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.400970771	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.108735178
	Input	Item	Description		
	1.108735178	PF2	adjustment factor for effects of progression		
	329.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.089362282
	Input	Item	Description		
	0.089362282	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.400970771	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3600)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3600)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway EB Off-Ramp (EW) - #3
Morning Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0.5	1
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	760.5	1521
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.5	0.5	0.5
Effective Green Time	50	50	50
Traffic Volume - With PHF	410	10	0
Peak Hour - Per Lane	0.0	0.0	0.0
Peak Hour - Total	0.0	0.0	0.0
Peak 15 Minutes - Per Lane	5.3	0.4	0.0
Peak 15 Minutes - Total	7.9	0.2	0.0

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	5.3	0.4	0.0
	Peak 15 Minutes - Total	7.9	0.2	0.0
70%	Peak 15 Minutes - Per Lane	7.1	1.5	1.0
	Peak 15 Minutes - Total	10.3	1.2	1.0
85%	Peak 15 Minutes - Per Lane	8.1	1.6	1.0
	Peak 15 Minutes - Total	11.6	1.3	1.0
90%	Peak 15 Minutes - Per Lane	8.6	1.6	1.0
	Peak 15 Minutes - Total	12.5	1.3	1.0
95%	Peak 15 Minutes - Per Lane	9.1	1.6	1.0
	Peak 15 Minutes - Total	13.1	1.3	1.0
98%	Peak 15 Minutes - Per Lane	9.9	1.7	1.0
	Peak 15 Minutes - Total	14.4	1.4	1.0

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	410
	Input	Item	Description		
	410	vi	lane group flow rate including initial queue present		
	410	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	273.3333333
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	273.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	5.26288102
	Input	Item	Description		
	5.26288102	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.182780578	Q1	first-term queued vehicles (vehicles)		
	0.080100442	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.182780578
	Input	Item	Description		
	5.182780578	Q1	first-term queued vehicles (vehicles)		
	1.119881524	PF2	adjustment factor for effects of progression		
	273.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.359412667	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.119881524
	Input	Item	Description		
	1.119881524	PF2	adjustment factor for effects of progression		
	273.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.080100442
	Input	Item	Description		
	0.080100442	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.359412667	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	10
	Input	Item	Description		
	10	vl	lane group flow rate including initial queue present		
	10	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	20
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	20	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0.419788249
	Input	Item	Description		
	0.419788249	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0.413927241	Q1	first-term queued vehicles (vehicles)		
	0.005861008	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0.413927241
	Input	Item	Description		
	0.413927241	Q1	first-term queued vehicles (vehicles)		
	1.470543878	PF2	adjustment factor for effects of progression		
	20	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.026298488	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.470543878
	Input	Item	Description		
	1.470543878	PF2	adjustment factor for effects of progression		
	20	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.005861008
	Input	Item	Description		
	0.005861008	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.026298488	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway EB Off-Ramp (EW) - #3
Evening Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0.5	1
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	760.5	1521
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.5	0.5	0.5
Effective Green Time	50	50	50
Traffic Volume - With PHF	207	17	0
Peak Hour - Per Lane	0.0	0.0	0.0
Peak Hour - Total	0.0	0.0	0.0
Peak 15 Minutes - Per Lane	2.8	0.7	0.0
Peak 15 Minutes - Total	4.2	0.4	0.0

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	2.8	0.7	0.0
	Peak 15 Minutes - Total	4.2	0.4	0.0
70%	Peak 15 Minutes - Per Lane	4.2	1.8	1.0
	Peak 15 Minutes - Total	5.9	1.4	1.0
85%	Peak 15 Minutes - Per Lane	4.7	2.0	1.0
	Peak 15 Minutes - Total	6.6	1.5	1.0
90%	Peak 15 Minutes - Per Lane	5.0	2.0	1.0
	Peak 15 Minutes - Total	7.1	1.5	1.0
95%	Peak 15 Minutes - Per Lane	5.3	2.1	1.0
	Peak 15 Minutes - Total	7.4	1.5	1.0
98%	Peak 15 Minutes - Per Lane	5.7	2.2	1.0
	Peak 15 Minutes - Total	8.1	1.6	1.0

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	207
	Input	Item	Description		
	207	vi	lane group flow rate including initial queue present		
	207	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	138
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	138	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	2.785016892
	Input	Item	Description		
	2.785016892	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	2.744575937	Q1	first-term queued vehicles (vehicles)		
	0.040440955	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	2.744575937
	Input	Item	Description		
	2.744575937	Q1	first-term queued vehicles (vehicles)		
	1.302031908	PF2	adjustment factor for effects of progression		
	138	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.181459566	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.302031908
	Input	Item	Description		
	1.302031908	PF2	adjustment factor for effects of progression		
	138	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.040440955
	Input	Item	Description		
	0.040440955	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.181459566	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	[illegible]	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	[illegible]	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	[illegible]	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	[illegible]	C	cycle length (seconds)		
	[illegible]	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	17
	Input	Item	Description		
	17	vi	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	34
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	34	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0.710380106
	Input	Item	Description		
	0.710380106	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0.700416393	Q1	first-term queued vehicles (vehicles)		
	0.009963714	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0.700416393
	Input	Item	Description		
	0.700416393	Q1	first-term queued vehicles (vehicles)		
	1.450078908	PF2	adjustment factor for effects of progression		
	34	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.044707429	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.450078908
	Input	Item	Description		
	1.450078908	PF2	adjustment factor for effects of progression		
	34	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.009963714
	Input	Item	Description		
	0.009963714	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.044707429	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway EB Off-Ramp (EW) - #3
Saturday Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0.5	1
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	760.5	1521
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.5	0.5	0.5
Effective Green Time	50	50	50
Traffic Volume - With PHF	255	66	0
Peak Hour - Per Lane	0.0	0.0	0.0
Peak Hour - Total	0.0	0.0	0.0
Peak 15 Minutes - Per Lane	3.4	2.7	0.0
Peak 15 Minutes - Total	5.1	1.3	0.0

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	3.4	2.7	0.0
	Peak 15 Minutes - Total	5.1	1.3	0.0
70%	Peak 15 Minutes - Per Lane	4.9	4.1	1.0
	Peak 15 Minutes - Total	6.9	2.5	1.0
85%	Peak 15 Minutes - Per Lane	5.6	4.6	1.0
	Peak 15 Minutes - Total	7.8	2.8	1.0
90%	Peak 15 Minutes - Per Lane	5.9	4.9	1.0
	Peak 15 Minutes - Total	8.4	2.9	1.0
95%	Peak 15 Minutes - Per Lane	6.2	5.1	1.0
	Peak 15 Minutes - Total	8.8	3.0	1.0
98%	Peak 15 Minutes - Per Lane	6.8	5.5	1.0
	Peak 15 Minutes - Total	9.7	3.3	1.0

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	255
	Input	Item	Description		
	255	vi	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	170
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	170	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	3.393561719
	Input	Item	Description		
	3.393561719	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	3.343743151	Q1	first-term queued vehicles (vehicles)		
	0.049818568	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	3.343743151
	Input	Item	Description		
	3.343743151	Q1	first-term queued vehicles (vehicles)		
	1.257889871	PF2	adjustment factor for effects of progression		
	170	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.223537147	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.257889871
	Input	Item	Description		
	1.257889871	PF2	adjustment factor for effects of progression		
	170	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.049818568
	Input	Item	Description		
	0.049818568	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.223537147	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	66
	Input	Item	Description		
	66	vi	lane group flow rate including initial queue present		
	66	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	132
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	132	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	2.669353264
	Input	Item	Description		
	2.669353264	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	2.630670611	Q1	first-term queued vehicles (vehicles)		
	0.038682653	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	2.630670611
	Input	Item	Description		
	2.630670611	Q1	first-term queued vehicles (vehicles)		
	1.310382456	PF2	adjustment factor for effects of progression		
	132	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.17357002	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.310382456
	Input	Item	Description		
	1.310382456	PF2	adjustment factor for effects of progression		
	132	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.038682653
	Input	Item	Description		
	0.038682653	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.17357002	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway WB Off-Ramp (EW) - #16
Morning Peak Hour

Description	Queue Analysis Left	Queue Analysis Thru	Queue Analysis Right
Lanes	**0.5**	**0**	**1.5**
Lane Capacity	**1700**	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	760.5	0	2281.5
Signal Cycle Length	**100**	100	100
Percent Green of Cycle	**0.4**	**0.4**	**0.4**
Effective Green Time	40	40	40
Traffic Volume - With PHF	**290**	**0**	**621**
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	10.6	#DIV/0!	8.1
Peak 15 Minutes - Total	5.3	#DIV/0!	12.1

Description		Left Turn Total Queue Analysis Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	10.6	#DIV/0!	8.1
	Peak 15 Minutes - Total	5.3	#DIV/0!	12.1
70%	Peak 15 Minutes - Per Lane	13.6	#DIV/0!	10.5
	Peak 15 Minutes - Total	7.2	#DIV/0!	15.4
85%	Peak 15 Minutes - Per Lane	15.4	#DIV/0!	11.9
	Peak 15 Minutes - Total	8.2	#DIV/0!	17.4
90%	Peak 15 Minutes - Per Lane	16.5	#DIV/0!	12.8
	Peak 15 Minutes - Total	8.7	#DIV/0!	18.8
95%	Peak 15 Minutes - Per Lane	17.3	#DIV/0!	13.4
	Peak 15 Minutes - Total	9.1	#DIV/0!	19.6
98%	Peak 15 Minutes - Per Lane	19.1	#DIV/0!	14.8
	Peak 15 Minutes - Total	10.0	#DIV/0!	21.7

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	608.4
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	304.2	c	lane group capacity (vehicles per hour)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.333333333	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.333333333
	Input	Item	Description		
	1.333333333	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	290
	Input	Item	Description		
	290	vl	lane group flow rate including initial queue present		
	290	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	580
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	608.4
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	580	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	304.2	c	lane group capacity (vehicles per hour)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	10.64390284
	Input	Item	Description		
	10.64390284	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	10.4314413	Q1	first-term queued vehicles (vehicles)		
	0.212461538	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	10.4314413
	Input	Item	Description		
	10.4314413	Q1	first-term queued vehicles (vehicles)		
	0.667617919	PF2	adjustment factor for effects of progression		
	580	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	0.953320184	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.667617919
	Input	Item	Description		
	0.667617919	PF2	adjustment factor for effects of progression		
	580	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.212461538
	Input	Item	Description		
	0.212461538	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.953320184	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.8)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.8)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	608.4
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	912.6	c	lane group capacity (vehicles per hour)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.333333333	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.333333333
	Input	Item	Description		
	1.333333333	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	621
	Input	Item	Description		
	621	vi	lane group flow rate including initial queue present		
	621	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	414
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	608.4
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	414	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	912.6	c	lane group capacity (vehicles per hour)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	8.099582575
	Input	Item	Description		
	8.099582575	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	7.947928994	Q1	first-term queued vehicles (vehicles)		
	0.151653581	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	7.947928994
	Input	Item	Description		
	7.947928994	Q1	first-term queued vehicles (vehicles)		
	0.838345996	PF2	adjustment factor for effects of progression		
	414	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	0.680473373	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.838345996
	Input	Item	Description		
	0.838345996	PF2	adjustment factor for effects of progression		
	414	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.151653581
	Input	Item	Description		
	0.151653581	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.680473373	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway WB Off-Ramp (EW) - #16
Evening Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	0.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	760.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.33	0.33	0.33
Effective Green Time	33	33	33
Traffic Volume - With PHF	383	0	262
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	18.7	#DIV/0!	3.9
Peak 15 Minutes - Total	9.4	#DIV/0!	5.8

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	18.7	#DIV/0!	3.9
	Peak 15 Minutes - Total	9.4	#DIV/0!	5.8
70%	Peak 15 Minutes - Per Lane	23.6	#DIV/0!	5.5
	Peak 15 Minutes - Total	12.0	#DIV/0!	7.8
85%	Peak 15 Minutes - Per Lane	26.5	#DIV/0!	6.2
	Peak 15 Minutes - Total	13.6	#DIV/0!	8.9
90%	Peak 15 Minutes - Per Lane	28.6	#DIV/0!	6.7
	Peak 15 Minutes - Total	14.7	#DIV/0!	9.5
95%	Peak 15 Minutes - Per Lane	29.8	#DIV/0!	7.0
	Peak 15 Minutes - Total	15.4	#DIV/0!	9.9
98%	Peak 15 Minutes - Per Lane	32.9	#DIV/0!	7.6
	Peak 15 Minutes - Total	16.9	#DIV/0!	10.9

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	383
	Input	Item	Description		
	383	vl	lane group flow rate including initial queue present		
	383	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	766
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	766	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	18.73785998
	Input	Item	Description		
	18.73785998	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	9.848469114	Q1	first-term queued vehicles (vehicles)		
	8.889390867	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	9.848469114
	Input	Item	Description		
	9.848469114	Q1	first-term queued vehicles (vehicles)		
	0.462852334	PF2	adjustment factor for effects of progression		
	766	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	1.526109218	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.462852334
	Input	Item	Description		
	0.462852334	PF2	adjustment factor for effects of progression		
	766	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	8.889390867
	Input	Item	Description		
	8.889390867	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	1.526109218	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	262
	Input	Item	Description		
	262	vi	lane group flow rate including initial queue present		
	262	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	174.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	174.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	3.896232238
	Input	Item	Description		
	3.896232238	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	3.818677486	Q1	first-term queued vehicles (vehicles)		
	0.077554752	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	3.818677486
	Input	Item	Description		
	3.818677486	Q1	first-term queued vehicles (vehicles)		
	1.039810099	PF2	adjustment factor for effects of progression		
	174.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0.347990092	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.039810099
	Input	Item	Description		
	1.039810099	PF2	adjustment factor for effects of progression		
	174.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.077554752
	Input	Item	Description		
	0.077554752	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.347990092	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway WB Off-Ramp (EW) - #16
Saturday Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	0.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	760.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.33	0.33	0.33
Effective Green Time	33	33	33
Traffic Volume - With PHF	435	0	418
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	21.5	#DIV/0!	6.0
Peak 15 Minutes - Total	10.8	#DIV/0!	9.0

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	21.5	#DIV/0!	6.0
	Peak 15 Minutes - Total	10.8	#DIV/0!	9.0
70%	Peak 15 Minutes - Per Lane	27.1	#DIV/0!	8.0
	Peak 15 Minutes - Total	13.7	#DIV/0!	11.6
85%	Peak 15 Minutes - Per Lane	30.3	#DIV/0!	9.1
	Peak 15 Minutes - Total	15.5	#DIV/0!	13.1
90%	Peak 15 Minutes - Per Lane	32.8	#DIV/0!	9.7
	Peak 15 Minutes - Total	16.7	#DIV/0!	14.1
95%	Peak 15 Minutes - Per Lane	34.1	#DIV/0!	10.2
	Peak 15 Minutes - Total	17.5	#DIV/0!	14.8
98%	Peak 15 Minutes - Per Lane	37.6	#DIV/0!	11.2
	Peak 15 Minutes - Total	19.3	#DIV/0!	16.3

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	435
	Input	Item	Description		
	435	vl	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	870
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	870	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	21.50666089
	Input	Item	Description		
	21.50666089	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	9.204089018	Q1	first-term queued vehicles (vehicles)		
	12.30257187	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	9.204089018
	Input	Item	Description		
	9.204089018	Q1	first-term queued vehicles (vehicles)		
	0.380858856	PF2	adjustment factor for effects of progression		
	870	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	1.733309426	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	0.380858856
	Input	Item	Description		
	0.380858856	PF2	adjustment factor for effects of progression		
	870	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	12.30257187
	Input	Item	Description		
	12.30257187	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	1.733309426	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	418
	Input	Item	Description		
	418	vi	lane group flow rate including initial queue present		
	418	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	278.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	278.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	5.99515125
	Input	Item	Description		
	5.99515125	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.87141886	Q1	first-term queued vehicles (vehicles)		
	0.12373239	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.87141886
	Input	Item	Description		
	5.87141886	Q1	first-term queued vehicles (vehicles)		
	0.92468681	PF2	adjustment factor for effects of progression		
	278.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0.555190299	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.92468681
	Input	Item	Description		
	0.92468681	PF2	adjustment factor for effects of progression		
	278.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.12373239
	Input	Item	Description		
	0.12373239	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.555190299	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway EB Off-Ramp (EW) - #17
Morning Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0	0.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	760.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.33	0.33	0.33
Effective Green Time	33	33	33
Traffic Volume - With PHF	401	0	243
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	5.8	#DIV/0!	9.7
Peak 15 Minutes - Total	8.7	#DIV/0!	4.8

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	5.8	#DIV/0!	9.7
	Peak 15 Minutes - Total	8.7	#DIV/0!	4.8
70%	Peak 15 Minutes - Per Lane	7.7	#DIV/0!	12.4
	Peak 15 Minutes - Total	11.2	#DIV/0!	6.6
85%	Peak 15 Minutes - Per Lane	8.8	#DIV/0!	14.1
	Peak 15 Minutes - Total	12.7	#DIV/0!	7.5
90%	Peak 15 Minutes - Per Lane	9.4	#DIV/0!	15.1
	Peak 15 Minutes - Total	13.6	#DIV/0!	8.0
95%	Peak 15 Minutes - Per Lane	9.8	#DIV/0!	15.8
	Peak 15 Minutes - Total	14.3	#DIV/0!	8.4
98%	Peak 15 Minutes - Per Lane	10.8	#DIV/0!	17.5
	Peak 15 Minutes - Total	15.7	#DIV/0!	9.2

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	401
	Input	Item	Description		
	401	vi	lane group flow rate including initial queue present		
	401	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	267.3333333
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	267.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	5.774430563
	Input	Item	Description		
	5.774430563	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.655730351	Q1	first-term queued vehicles (vehicles)		
	0.118700212	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.655730351
	Input	Item	Description		
	5.655730351	Q1	first-term queued vehicles (vehicles)		
	0.936949415	PF2	adjustment factor for effects of progression		
	267.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0.532610789	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.936949415
	Input	Item	Description		
	0.936949415	PF2	adjustment factor for effects of progression		
	267.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.118700212
	Input	Item	Description		
	0.118700212	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.532610789	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal.	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	243
	Input	Item	Description		
	243	vi	lane group flow rate including initial queue present		
	243	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	486
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	486	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	9.687359704
	Input	Item	Description		
	9.687359704	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	9.471568047	Q1	first-term queued vehicles (vehicles)		
	0.215791657	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	9.471568047
	Input	Item	Description		
	9.471568047	Q1	first-term queued vehicles (vehicles)		
	0.712564937	PF2	adjustment factor for effects of progression		
	486	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0.968262507	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	0.712564937
	Input	Item	Description		
	0.712564937	PF2	adjustment factor for effects of progression		
	486	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.215791657
	Input	Item	Description		
	0.215791657	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.968262507	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway EB Off-Ramp (EW) - #17
Evening Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0	0.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	760.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.38	0.38	0.38
Effective Green Time	38	38	38
Traffic Volume - With PHF	397	0	420
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	5.5	#DIV/0!	17.6
Peak 15 Minutes - Total	8.3	#DIV/0!	8.8

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	5.5	#DIV/0!	17.6
	Peak 15 Minutes - Total	8.3	#DIV/0!	8.8
70%	Peak 15 Minutes - Per Lane	7.5	#DIV/0!	22.1
	Peak 15 Minutes - Total	10.8	#DIV/0!	11.3
85%	Peak 15 Minutes - Per Lane	8.4	#DIV/0!	24.9
	Peak 15 Minutes - Total	12.2	#DIV/0!	12.8
90%	Peak 15 Minutes - Per Lane	9.0	#DIV/0!	26.8
	Peak 15 Minutes - Total	13.1	#DIV/0!	13.8
95%	Peak 15 Minutes - Per Lane	9.5	#DIV/0!	28.0
	Peak 15 Minutes - Total	13.7	#DIV/0!	14.5
98%	Peak 15 Minutes - Per Lane	10.4	#DIV/0!	30.9
	Peak 15 Minutes - Total	15.1	#DIV/0!	15.9

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	866.97	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.306451613
	Input	Item	Description		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	397
	Input	Item	Description		
	397	vi	lane group flow rate including initial queue present		
	397	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	264.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	264.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	866.97	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	5.53894372
	Input	Item	Description		
	5.53894372	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.436890204	Q1	first-term queued vehicles (vehicles)		
	0.102053516	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.436890204
	Input	Item	Description		
	5.436890204	Q1	first-term queued vehicles (vehicles)		
	0.98523038	PF2	adjustment factor for effects of progression		
	264.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0.457916652	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	0.98523038
	Input	Item	Description		
	0.98523038	PF2	adjustment factor for effects of progression		
	264.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.102053516
	Input	Item	Description		
	0.102053516	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.457916652	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	288.99	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.306451613
	Input	Item	Description		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	420
	Input	Item	Description		
	420	vl	lane group flow rate including initial queue present		
	420	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	840
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	840	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	288.99	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	17.57038564
	Input	Item	Description		
	17.57038564	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	9.879753691	Q1	first-term queued vehicles (vehicles)		
	7.690631951	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	9.879753691
	Input	Item	Description		
	9.879753691	Q1	first-term queued vehicles (vehicles)		
	0.423418015	PF2	adjustment factor for effects of progression		
	840	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	1.453337486	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	0.423418015
	Input	Item	Description		
	0.423418015	PF2	adjustment factor for effects of progression		
	840	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	7.690631951
	Input	Item	Description		
	7.690631951	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	1.453337486	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway EB Off-Ramp (EW) - #17
Saturday Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0	0.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	760.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.38	0.38	0.38
Effective Green Time	38	38	38
Traffic Volume - With PHF	415	0	352
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	5.8	#DIV/0!	14.4
Peak 15 Minutes - Total	8.6	#DIV/0!	7.2

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	5.8	#DIV/0!	14.4
	Peak 15 Minutes - Total	8.6	#DIV/0!	7.2
70%	Peak 15 Minutes - Per Lane	7.7	#DIV/0!	18.1
	Peak 15 Minutes - Total	11.2	#DIV/0!	9.4
85%	Peak 15 Minutes - Per Lane	8.8	#DIV/0!	20.4
	Peak 15 Minutes - Total	12.7	#DIV/0!	10.7
90%	Peak 15 Minutes - Per Lane	9.4	#DIV/0!	22.0
	Peak 15 Minutes - Total	13.6	#DIV/0!	11.4
95%	Peak 15 Minutes - Per Lane	9.8	#DIV/0!	23.0
	Peak 15 Minutes - Total	14.3	#DIV/0!	12.0
98%	Peak 15 Minutes - Per Lane	10.8	#DIV/0!	25.4
	Peak 15 Minutes - Total	15.7	#DIV/0!	13.2

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	[illegible]	Qb	lane group initial queue at start of analysis period (vehicles)		
	[illegible]	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	[illegible]	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	866.97	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	[illegible]	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	[illegible]	C	cycle length (seconds)		
	[illegible]	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.306451613
	Input	Item	Description		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	415
	Input	Item	Description		
	415	vl	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	[illegible]	Qb	lane group initial queue at start of analysis period (vehicles)		
	[illegible]	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	276.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	276.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	866.97	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	5.765523494
	Input	Item	Description		
	5.765523494	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.658842867	Q1	first-term queued vehicles (vehicles)		
	0.106680627	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.658842867
	Input	Item	Description		
	5.658842867	Q1	first-term queued vehicles (vehicles)		
	0.971603632	PF2	adjustment factor for effects of progression		
	276.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0.478678616	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	0.971603632
	Input	Item	Description		
	0.971603632	PF2	adjustment factor for effects of progression		
	276.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.106680627
	Input	Item	Description		
	0.106680627	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.478678616	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	288.99	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.306451613
	Input	Item	Description		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12l((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210l(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	352
	Input	Item	Description		
	352	vl	lane group flow rate including initial queue present		
	352	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	704
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	704	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	288.99	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	14.36183761
	Input	Item	Description		
	14.36183761	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	10.54730798	Q1	first-term queued vehicles (vehicles)		
	3.814529635	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	10.54730798
	Input	Item	Description		
	10.54730798	Q1	first-term queued vehicles (vehicles)		
	0.539350976	PF2	adjustment factor for effects of progression		
	704	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	1.218035226	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.539350976
	Input	Item	Description		
	0.539350976	PF2	adjustment factor for effects of progression		
	704	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	3.814529635
	Input	Item	Description		
	3.814529635	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	1.218035226	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12l((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210l(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway WB Off-Ramp (EW) - #2
Morning Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.54	0.54	0.54
Effective Green Time	54	54	54
Traffic Volume - With PHF	391	0	573
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	4.9	#DIV/0!	6.9
Peak 15 Minutes - Total	7.4	#DIV/0!	10.3

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	4.9	#DIV/0!	6.9
	Peak 15 Minutes - Total	7.4	#DIV/0!	10.3
70%	Peak 15 Minutes - Per Lane	6.7	#DIV/0!	9.1
	Peak 15 Minutes - Total	9.6	#DIV/0!	13.2
85%	Peak 15 Minutes - Per Lane	7.6	#DIV/0!	10.3
	Peak 15 Minutes - Total	10.9	#DIV/0!	14.9
90%	Peak 15 Minutes - Per Lane	8.1	#DIV/0!	11.0
	Peak 15 Minutes - Total	11.7	#DIV/0!	16.0
95%	Peak 15 Minutes - Per Lane	8.5	#DIV/0!	11.5
	Peak 15 Minutes - Total	12.3	#DIV/0!	16.8
98%	Peak 15 Minutes - Per Lane	9.3	#DIV/0!	12.7
	Peak 15 Minutes - Total	13.5	#DIV/0!	18.5

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	130	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	391
	Input	Item	Description		
	391	vl	lane group flow rate including initial queue present		
	391	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	260.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	260.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	4.903539701
	Input	Item	Description		
	4.903539701	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	4.832809636	Q1	first-term queued vehicles (vehicles)		
	0.070730065	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	4.832809636
	Input	Item	Description		
	4.832809636	Q1	first-term queued vehicles (vehicles)		
	1.202306148	PF2	adjustment factor for effects of progression		
	260.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.317367554	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.202306148
	Input	Item	Description		
	1.202306148	PF2	adjustment factor for effects of progression		
	260.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.070730065
	Input	Item	Description		
	0.070730065	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.317367554	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.22	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	573
	Input	Item	Description		
	573	vi	lane group flow rate including initial queue present		
	573	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	382
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	382	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	6.877044055
	Input	Item	Description		
	6.877044055	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	6.773391044	Q1	first-term queued vehicles (vehicles)		
	0.103653011	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	6.773391044
	Input	Item	Description		
	6.773391044	Q1	first-term queued vehicles (vehicles)		
	1.039158909	PF2	adjustment factor for effects of progression		
	382	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.465093627	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.039158909
	Input	Item	Description		
	1.039158909	PF2	adjustment factor for effects of progression		
	382	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.103653011
	Input	Item	Description		
	0.103653011	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.465093627	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.22	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway WB Off-Ramp (EW) - #2
Evening Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.54	0.54	0.54
Effective Green Time	54	54	54
Traffic Volume - With PHF	368	0	334
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	4.6	#DIV/0!	4.2
Peak 15 Minutes - Total	7.0	#DIV/0!	6.4

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	4.6	#DIV/0!	4.2
	Peak 15 Minutes - Total	7.0	#DIV/0!	6.4
70%	Peak 15 Minutes - Per Lane	6.4	#DIV/0!	5.9
	Peak 15 Minutes - Total	9.1	#DIV/0!	8.4
85%	Peak 15 Minutes - Per Lane	7.2	#DIV/0!	6.7
	Peak 15 Minutes - Total	10.4	#DIV/0!	9.6
90%	Peak 15 Minutes - Per Lane	7.7	#DIV/0!	7.2
	Peak 15 Minutes - Total	11.1	#DIV/0!	10.3
95%	Peak 15 Minutes - Per Lane	8.1	#DIV/0!	7.5
	Peak 15 Minutes - Total	11.7	#DIV/0!	10.7
98%	Peak 15 Minutes - Per Lane	8.9	#DIV/0!	8.2
	Peak 15 Minutes - Total	12.8	#DIV/0!	11.8

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)	Equation		Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)	Equation		Results	0
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	821.34
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2	Equation		Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))	Equation		Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)	Equation		Results	368
	Input	Item	Description		
	368	vi	lane group flow rate including initial queue present		
	368	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)	Equation		Results	245.3333333
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	821.34
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	245.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2	Equation		Results	4.64017196
	Input	Item	Description		
	4.64017196	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	4.573602487	Q1	first-term queued vehicles (vehicles)		
	0.066569473	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	4.573602487
	Input	Item	Description		
	4.573602487	Q1	first-term queued vehicles (vehicles)		
	1.223642403	PF2	adjustment factor for effects of progression		
	245.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.298698874	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))	Equation		Results	1.223642403
	Input	Item	Description		
	1.223642403	PF2	adjustment factor for effects of progression		
	245.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	0.066569473
	Input	Item	Description		
	0.066569473	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.298698874	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	334
	Input	Item	Description		
	334	vl	lane group flow rate including initial queue present		
	334	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	222.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	222.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	4.245104141
	Input	Item	Description		
	4.245104141	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	4.184685108	Q1	first-term queued vehicles (vehicles)		
	0.060419033	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	4.184685108
	Input	Item	Description		
	4.184685108	Q1	first-term queued vehicles (vehicles)		
	1.255478379	PF2	adjustment factor for effects of progression		
	222.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.271101696	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.255478379
	Input	Item	Description		
	1.255478379	PF2	adjustment factor for effects of progression		
	222.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.060419033
	Input	Item	Description		
	0.060419033	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.271101696	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway WB Off-Ramp (EW) - #2
Saturday Peak Hour

Description	Queue Analysis Left	Thru	Right
Lanes	1.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.54	0.54	0.54
Effective Green Time	54	54	54
Traffic Volume - With PHF	549	0	494
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	6.6	#DIV/0!	6.0
Peak 15 Minutes - Total	9.9	#DIV/0!	9.1

Description		Left Turn Total Queue Analysis Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	6.6	#DIV/0!	6.0
	Peak 15 Minutes - Total	9.9	#DIV/0!	9.1
70%	Peak 15 Minutes - Per Lane	8.8	#DIV/0!	8.1
	Peak 15 Minutes - Total	12.7	#DIV/0!	11.7
85%	Peak 15 Minutes - Per Lane	9.9	#DIV/0!	9.1
	Peak 15 Minutes - Total	14.4	#DIV/0!	13.2
90%	Peak 15 Minutes - Per Lane	10.6	#DIV/0!	9.8
	Peak 15 Minutes - Total	15.5	#DIV/0!	14.2
95%	Peak 15 Minutes - Per Lane	11.1	#DIV/0!	10.3
	Peak 15 Minutes - Total	16.2	#DIV/0!	14.9
98%	Peak 15 Minutes - Per Lane	12.3	#DIV/0!	11.3
	Peak 15 Minutes - Total	17.9	#DIV/0!	16.4

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	549
	Input	Item	Description		
	549	vi	lane group flow rate including initial queue present		
	549	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	366
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	366	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	6.628036047
	Input	Item	Description		
	6.628036047	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	6.528724523	Q1	first-term queued vehicles (vehicles)		
	0.099311524	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	6.528724523
	Input	Item	Description		
	6.528724523	Q1	first-term queued vehicles (vehicles)		
	1.060094785	PF2	adjustment factor for effects of progression		
	366	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.445613266	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.060094785
	Input	Item	Description		
	1.060094785	PF2	adjustment factor for effects of progression		
	366	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.099311524
	Input	Item	Description		
	0.099311524	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.445613266	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)	Equation		Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)	Equation		Results	#DIV/0!
G16-3	sL=(s/NLG)	Equation		Results	#DIV/0!
G-16-4	cL=(c/NLG)	Equation		Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)	Equation		Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2	Equation		Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))	Equation		Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)	Equation		Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)	Equation		Results	#DIV/0!
G16-3	sL=(s/NLG)	Equation		Results	#DIV/0!
G-16-4	cL=(c/NLG)	Equation		Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)	Equation		Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2	Equation		Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))	Equation		Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	494
	Input	Item	Description		
	494	vl	lane group flow rate including initial queue present		
	494	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	329.3333333
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	329.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	6.044520032
	Input	Item	Description		
	6.044520032	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.95515775	Q1	first-term queued vehicles (vehicles)		
	0.089362282	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.95515775
	Input	Item	Description		
	5.95515775	Q1	first-term queued vehicles (vehicles)		
	1.108735178	PF2	adjustment factor for effects of progression		
	329.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.400970771	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.108735178
	Input	Item	Description		
	1.108735178	PF2	adjustment factor for effects of progression		
	329.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.089362282
	Input	Item	Description		
	0.089362282	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.400970771	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway EB Off-Ramp (EW) - #3
Morning Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0.5	1
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	760.5	1521
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.5	0.5	0.5
Effective Green Time	50	50	50
Traffic Volume - With PHF	469	10	0
Peak Hour - Per Lane	0.0	0.0	0.0
Peak Hour - Total	0.0	0.0	0.0
Peak 15 Minutes - Per Lane	5.9	0.4	0.0
Peak 15 Minutes - Total	8.9	0.2	0.0

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	5.9	0.4	0.0
	Peak 15 Minutes - Total	8.9	0.2	0.0
70%	Peak 15 Minutes - Per Lane	7.9	1.5	1.0
	Peak 15 Minutes - Total	11.5	1.2	1.0
85%	Peak 15 Minutes - Per Lane	9.0	1.6	1.0
	Peak 15 Minutes - Total	13.0	1.3	1.0
90%	Peak 15 Minutes - Per Lane	9.6	1.6	1.0
	Peak 15 Minutes - Total	14.0	1.3	1.0
95%	Peak 15 Minutes - Per Lane	10.1	1.6	1.0
	Peak 15 Minutes - Total	14.6	1.3	1.0
98%	Peak 15 Minutes - Per Lane	11.1	1.7	1.0
	Peak 15 Minutes - Total	16.1	1.4	1.0

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	469
	Input	Item	Description		
	469	vi	lane group flow rate including initial queue present		
	469	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	312.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	312.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	5.935997267
	Input	Item	Description		
	5.935997267	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.844370176	Q1	first-term queued vehicles (vehicles)		
	0.091627091	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.844370176
	Input	Item	Description		
	5.844370176	Q1	first-term queued vehicles (vehicles)		
	1.069168539	PF2	adjustment factor for effects of progression		
	312.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.411133027	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.069168539
	Input	Item	Description		
	1.069168539	PF2	adjustment factor for effects of progression		
	312.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.091627091
	Input	Item	Description		
	0.091627091	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.411133027	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	10
	Input	Item	Description		
	10	vi	lane group flow rate including initial queue present		
	10	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	20
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	20	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0.419788249
	Input	Item	Description		
	0.419788249	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0.413927241	Q1	first-term queued vehicles (vehicles)		
	0.005861008	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0.413927241
	Input	Item	Description		
	0.413927241	Q1	first-term queued vehicles (vehicles)		
	1.470543878	PF2	adjustment factor for effects of progression		
	20	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.026298488	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.470543878
	Input	Item	Description		
	1.470543878	PF2	adjustment factor for effects of progression		
	20	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.005861008
	Input	Item	Description		
	0.005861008	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.026298488	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway EB Off-Ramp (EW) - #3
Evening Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0.5	1
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	760.5	1521
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.5	0.5	0.5
Effective Green Time	50	50	50
Traffic Volume - With PHF	279	17	0
Peak Hour - Per Lane	0.0	0.0	0.0
Peak Hour - Total	0.0	0.0	0.0
Peak 15 Minutes - Per Lane	3.7	0.7	0.0
Peak 15 Minutes - Total	5.5	0.4	0.0

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	3.7	0.7	0.0
	Peak 15 Minutes - Total	5.5	0.4	0.0
70%	Peak 15 Minutes - Per Lane	5.3	1.8	1.0
	Peak 15 Minutes - Total	7.5	1.4	1.0
85%	Peak 15 Minutes - Per Lane	6.0	2.0	1.0
	Peak 15 Minutes - Total	8.4	1.5	1.0
90%	Peak 15 Minutes - Per Lane	6.4	2.0	1.0
	Peak 15 Minutes - Total	9.0	1.5	1.0
95%	Peak 15 Minutes - Per Lane	6.6	2.1	1.0
	Peak 15 Minutes - Total	9.5	1.5	1.0
98%	Peak 15 Minutes - Per Lane	7.3	2.2	1.0
	Peak 15 Minutes - Total	10.4	1.6	1.0

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)	Equation		Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)	Equation		Results	0
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	760.5
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2	Equation		Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))	Equation		Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)	Equation		Results	279
	Input	Item	Description		
	279	vl	lane group flow rate including initial queue present		
	279	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)	Equation		Results	186
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	760.5
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	186	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2	Equation		Results	3.692574435
	Input	Item	Description		
	3.692574435	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	3.638067061	Q1	first-term queued vehicles (vehicles)		
	0.054507374	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	3.638067061
	Input	Item	Description		
	3.638067061	Q1	first-term queued vehicles (vehicles)		
	1.236067831	PF2	adjustment factor for effects of progression		
	186	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.244575937	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))	Equation		Results	1.236067831
	Input	Item	Description		
	1.236067831	PF2	adjustment factor for effects of progression		
	186	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	0.054507374
	Input	Item	Description		
	0.054507374	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.244575937	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	17
	Input	Item	Description		
	17	vl	lane group flow rate including initial queue present		
	17	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	34
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	34	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0.710380106
	Input	Item	Description		
	0.710380106	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0.700416393	Q1	first-term queued vehicles (vehicles)		
	0.009963714	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0.700416393
	Input	Item	Description		
	0.700416393	Q1	first-term queued vehicles (vehicles)		
	1.450078908	PF2	adjustment factor for effects of progression		
	34	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.044707429	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.450078908
	Input	Item	Description		
	1.450078908	PF2	adjustment factor for effects of progression		
	34	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.009963714
	Input	Item	Description		
	0.009963714	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.044707429	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway EB Off-Ramp (EW) - #3
Saturday Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0.5	1
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	760.5	1521
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.5	0.5	0.5
Effective Green Time	50	50	50
Traffic Volume - With PHF	354	66	0
Peak Hour - Per Lane	0.0	0.0	0.0
Peak Hour - Total	0.0	0.0	0.0
Peak 15 Minutes - Per Lane	4.6	2.7	0.0
Peak 15 Minutes - Total	6.9	1.3	0.0

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	4.6	2.7	0.0
	Peak 15 Minutes - Total	6.9	1.3	0.0
70%	Peak 15 Minutes - Per Lane	6.4	4.1	1.0
	Peak 15 Minutes - Total	9.1	2.5	1.0
85%	Peak 15 Minutes - Per Lane	7.2	4.6	1.0
	Peak 15 Minutes - Total	10.3	2.8	1.0
90%	Peak 15 Minutes - Per Lane	7.7	4.9	1.0
	Peak 15 Minutes - Total	11.0	2.9	1.0
95%	Peak 15 Minutes - Per Lane	8.0	5.1	1.0
	Peak 15 Minutes - Total	11.6	3.0	1.0
98%	Peak 15 Minutes - Per Lane	8.8	5.5	1.0
	Peak 15 Minutes - Total	12.7	3.3	1.0

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.8)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	354
	Input	Item	Description		
	354	vi	lane group flow rate including initial queue present		
	354	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	236
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	236	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	4.60438891
	Input	Item	Description		
	4.60438891	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	4.535229016	Q1	first-term queued vehicles (vehicles)		
	0.069159894	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	4.535229016
	Input	Item	Description		
	4.535229016	Q1	first-term queued vehicles (vehicles)		
	1.168943794	PF2	adjustment factor for effects of progression		
	236	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.310322156	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.168943794
	Input	Item	Description		
	1.168943794	PF2	adjustment factor for effects of progression		
	236	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.069159894
	Input	Item	Description		
	0.069159894	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.310322156	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.8)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	66
	Input	Item	Description		
	66	vi	lane group flow rate including initial queue present		
	66	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	132
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	132	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	2.669353264
	Input	Item	Description		
	2.669353264	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	2.630670611	Q1	first-term queued vehicles (vehicles)		
	0.038682653	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	2.630670611
	Input	Item	Description		
	2.630670611	Q1	first-term queued vehicles (vehicles)		
	1.310382456	PF2	adjustment factor for effects of progression		
	132	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.17357002	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.310382456
	Input	Item	Description		
	1.310382456	PF2	adjustment factor for effects of progression		
	132	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.038682653
	Input	Item	Description		
	0.038682653	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.17357002	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway WB Off-Ramp (EW) - #16
Morning Peak Hour

	Queue Analysis		
Description	Left	Thru	Right
Lanes	0.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	760.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.4	0.4	0.4
Effective Green Time	40	40	40
Traffic Volume - With PHF	290	0	680
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	10.6	#DIV/0!	8.7
Peak 15 Minutes - Total	5.3	#DIV/0!	13.1

		Left Turn Total Queue Analysis		
Description		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	10.6	#DIV/0!	8.7
	Peak 15 Minutes - Total	5.3	#DIV/0!	13.1
70%	Peak 15 Minutes - Per Lane	13.6	#DIV/0!	11.3
	Peak 15 Minutes - Total	7.2	#DIV/0!	16.5
85%	Peak 15 Minutes - Per Lane	15.4	#DIV/0!	12.8
	Peak 15 Minutes - Total	8.2	#DIV/0!	18.7
90%	Peak 15 Minutes - Per Lane	16.5	#DIV/0!	13.7
	Peak 15 Minutes - Total	8.7	#DIV/0!	20.2
95%	Peak 15 Minutes - Per Lane	17.3	#DIV/0!	14.4
	Peak 15 Minutes - Total	9.1	#DIV/0!	21.1
98%	Peak 15 Minutes - Per Lane	19.1	#DIV/0!	15.9
	Peak 15 Minutes - Total	10.0	#DIV/0!	23.3

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	608.4
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	304.2	c	lane group capacity (vehicles per hour)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.333333333	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.333333333
	Input	Item	Description		
	1.333333333	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	290
	Input	Item	Description		
	290	vi	lane group flow rate including initial queue present		
	290	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	580
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	608.4
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	580	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	304.2	c	lane group capacity (vehicles per hour)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	10.64390284
	Input	Item	Description		
	10.64390284	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	10.4314413	Q1	first-term queued vehicles (vehicles)		
	0.212461538	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	10.4314413
	Input	Item	Description		
	10.4314413	Q1	first-term queued vehicles (vehicles)		
	0.667617919	PF2	adjustment factor for effects of progression		
	580	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	0.953320184	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.667617919
	Input	Item	Description		
	0.667617919	PF2	adjustment factor for effects of progression		
	580	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.212461538
	Input	Item	Description		
	0.212461538	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.953320184	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	608.4
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	912.6	c	lane group capacity (vehicles per hour)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		

Determination of Back of Queue

G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.333333333	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.333333333
	Input	Item	Description		
	1.333333333	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	680
	Input	Item	Description		
	680	vi	lane group flow rate including initial queue present		
	680	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	453.3333333
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	608.4
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	453.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	912.6	c	lane group capacity (vehicles per hour)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		

Determination of Back of Queue

G16-6	Q=Q1+Q2		Equation	Results	8.738849451
	Input	Item	Description		
	8.738849451	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	8.572787559	Q1	first-term queued vehicles (vehicles)		
	0.166061892	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	8.572787559
	Input	Item	Description		
	8.572787559	Q1	first-term queued vehicles (vehicles)		
	0.796456623	PF2	adjustment factor for effects of progression		
	453.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	0.745123822	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.796456623
	Input	Item	Description		
	0.796456623	PF2	adjustment factor for effects of progression		
	453.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.166061892
	Input	Item	Description		
	0.166061892	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.745123822	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway WB Off-Ramp (EW) - #16
Evening Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	0.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	760.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.33	0.33	0.33
Effective Green Time	33	33	33
Traffic Volume - With PHF	383	0	340
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	18.7	#DIV/0!	5.0
Peak 15 Minutes - Total	9.4	#DIV/0!	7.4

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	18.7	#DIV/0!	5.0
	Peak 15 Minutes - Total	9.4	#DIV/0!	7.4
70%	Peak 15 Minutes - Per Lane	23.6	#DIV/0!	6.8
	Peak 15 Minutes - Total	12.0	#DIV/0!	9.7
85%	Peak 15 Minutes - Per Lane	26.5	#DIV/0!	7.7
	Peak 15 Minutes - Total	13.6	#DIV/0!	11.0
90%	Peak 15 Minutes - Per Lane	28.6	#DIV/0!	8.2
	Peak 15 Minutes - Total	14.7	#DIV/0!	11.8
95%	Peak 15 Minutes - Per Lane	29.8	#DIV/0!	8.6
	Peak 15 Minutes - Total	15.4	#DIV/0!	12.4
98%	Peak 15 Minutes - Per Lane	32.9	#DIV/0!	9.4
	Peak 15 Minutes - Total	16.9	#DIV/0!	13.7

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	383
	Input	Item	Description		
	383	vi	lane group flow rate including initial queue present		
	383	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	766
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	766	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	18.73785998
	Input	Item	Description		
	18.73785998	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	9.848469114	Q1	first-term queued vehicles (vehicles)		
	8.889390867	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	9.848469114
	Input	Item	Description		
	9.848469114	Q1	first-term queued vehicles (vehicles)		
	0.462852334	PF2	adjustment factor for effects of progression		
	766	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	1.526109218	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.462852334
	Input	Item	Description		
	0.462852334	PF2	adjustment factor for effects of progression		
	766	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	8.889390867
	Input	Item	Description		
	8.889390867	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	1.526109218	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	340
	Input	Item	Description		
	340	vl	lane group flow rate including initial queue present		
	340	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	226.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	226.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	4.966309028
	Input	Item	Description		
	4.966309028	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	4.865665457	Q1	first-term queued vehicles (vehicles)		
	0.100643571	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	4.865665457
	Input	Item	Description		
	4.865665457	Q1	first-term queued vehicles (vehicles)		
	0.981520121	PF2	adjustment factor for effects of progression		
	226.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0.451590195	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.981520121
	Input	Item	Description		
	0.981520121	PF2	adjustment factor for effects of progression		
	226.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.100643571
	Input	Item	Description		
	0.100643571	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.451590195	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway WB Off-Ramp (EW) - #16
Saturday Peak Hour

Description	Queue Analysis Left	Queue Analysis Thru	Queue Analysis Right
Lanes	0.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	760.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.33	0.33	0.33
Effective Green Time	33	33	33
Traffic Volume - With PHF	435	0	517
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	21.5	#DIV/0!	7.2
Peak 15 Minutes - Total	10.8	#DIV/0!	10.9

Description		Left Turn Total Queue Analysis Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	21.5	#DIV/0!	7.2
	Peak 15 Minutes - Total	10.8	#DIV/0!	10.9
70%	Peak 15 Minutes - Per Lane	27.1	#DIV/0!	9.5
	Peak 15 Minutes - Total	13.7	#DIV/0!	13.8
85%	Peak 15 Minutes - Per Lane	30.3	#DIV/0!	10.8
	Peak 15 Minutes - Total	15.5	#DIV/0!	15.7
90%	Peak 15 Minutes - Per Lane	32.8	#DIV/0!	11.5
	Peak 15 Minutes - Total	16.7	#DIV/0!	16.9
95%	Peak 15 Minutes - Per Lane	34.1	#DIV/0!	12.1
	Peak 15 Minutes - Total	17.5	#DIV/0!	17.7
98%	Peak 15 Minutes - Per Lane	37.6	#DIV/0!	13.3
	Peak 15 Minutes - Total	19.3	#DIV/0!	19.5

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	435
	Input	Item	Description		
	435	vl	lane group flow rate including initial queue present		
	435	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	870
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	870	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	21.50666089
	Input	Item	Description		
	21.50666089	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	9.204089018	Q1	first-term queued vehicles (vehicles)		
	12.30257187	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	9.204089018
	Input	Item	Description		
	9.204089018	Q1	first-term queued vehicles (vehicles)		
	0.380858856	PF2	adjustment factor for effects of progression		
	870	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	1.733309426	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.380858856
	Input	Item	Description		
	0.380858856	PF2	adjustment factor for effects of progression		
	870	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	12.30257187
	Input	Item	Description		
	12.30257187	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	1.733309426	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	517
	Input	Item	Description		
	517	vl	lane group flow rate including initial queue present		
	517	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	344.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	344.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	7.241608018
	Input	Item	Description		
	7.241608018	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	7.088570588	Q1	first-term queued vehicles (vehicles)		
	0.15303743	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	7.088570588
	Input	Item	Description		
	7.088570588	Q1	first-term queued vehicles (vehicles)		
	0.854649951	PF2	adjustment factor for effects of progression		
	344.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0.686682738	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.854649951
	Input	Item	Description		
	0.854649951	PF2	adjustment factor for effects of progression		
	344.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.15303743
	Input	Item	Description		
	0.15303743	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.686682738	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway EB Off-Ramp (EW) - #17
Morning Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	**1.5**	0	**0.5**
Lane Capacity	**1700**	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	760.5
Signal Cycle Length	**100**	100	100
Percent Green of Cycle	**0.33**	**0.33**	**0.33**
Effective Green Time	33	33	33
Traffic Volume - With PHF	**401**	**0**	**243**
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	5.8	#DIV/0!	9.7
Peak 15 Minutes - Total	8.7	#DIV/0!	4.8

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	5.8	#DIV/0!	9.7
	Peak 15 Minutes - Total	8.7	#DIV/0!	4.8
70%	Peak 15 Minutes - Per Lane	7.7	#DIV/0!	12.4
	Peak 15 Minutes - Total	11.2	#DIV/0!	6.6
85%	Peak 15 Minutes - Per Lane	8.8	#DIV/0!	14.1
	Peak 15 Minutes - Total	12.7	#DIV/0!	7.5
90%	Peak 15 Minutes - Per Lane	9.4	#DIV/0!	15.1
	Peak 15 Minutes - Total	13.6	#DIV/0!	8.0
95%	Peak 15 Minutes - Per Lane	9.8	#DIV/0!	15.8
	Peak 15 Minutes - Total	14.3	#DIV/0!	8.4
98%	Peak 15 Minutes - Per Lane	10.8	#DIV/0!	17.5
	Peak 15 Minutes - Total	15.7	#DIV/0!	9.2

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	401
	Input	Item	Description		
	401	vi	lane group flow rate including initial queue present		
	401	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	267.3333333
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	267.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	5.774430563
	Input	Item	Description		
	5.774430563	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.655730351	Q1	first-term queued vehicles (vehicles)		
	0.118700212	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.655730351
	Input	Item	Description		
	5.655730351	Q1	first-term queued vehicles (vehicles)		
	0.936949415	PF2	adjustment factor for effects of progression		
	267.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0.532610789	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	0.936949415
	Input	Item	Description		
	0.936949415	PF2	adjustment factor for effects of progression		
	267.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.118700212
	Input	Item	Description		
	0.118700212	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.532610789	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	243
	Input	Item	Description		
	243	vl	lane group flow rate including initial queue present		
	243	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	486
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	486	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	9.687359704
	Input	Item	Description		
	9.687359704	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	9.471568047	Q1	first-term queued vehicles (vehicles)		
	0.215791657	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	9.471568047
	Input	Item	Description		
	9.471568047	Q1	first-term queued vehicles (vehicles)		
	0.712564937	PF2	adjustment factor for effects of progression		
	486	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0.968262507	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.712564937
	Input	Item	Description		
	0.712564937	PF2	adjustment factor for effects of progression		
	486	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.215791657
	Input	Item	Description		
	0.215791657	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.968262507	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway EB Off-Ramp (EW) - #17
Evening Peak Hour

Description	Queue Analysis Left	Queue Analysis Thru	Queue Analysis Right
Lanes	1.5	0	0.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	760.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.38	0.38	0.38
Effective Green Time	38	38	38
Traffic Volume - With PHF	397	0	420
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	5.5	#DIV/0!	17.6
Peak 15 Minutes - Total	8.3	#DIV/0!	8.8

Description		Left Turn Total Queue Analysis Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	5.5	#DIV/0!	17.6
	Peak 15 Minutes - Total	8.3	#DIV/0!	8.8
70%	Peak 15 Minutes - Per Lane	7.5	#DIV/0!	22.1
	Peak 15 Minutes - Total	10.8	#DIV/0!	11.3
85%	Peak 15 Minutes - Per Lane	8.4	#DIV/0!	24.9
	Peak 15 Minutes - Total	12.2	#DIV/0!	12.8
90%	Peak 15 Minutes - Per Lane	9.0	#DIV/0!	26.8
	Peak 15 Minutes - Total	13.1	#DIV/0!	13.8
95%	Peak 15 Minutes - Per Lane	9.5	#DIV/0!	28.0
	Peak 15 Minutes - Total	13.7	#DIV/0!	14.5
98%	Peak 15 Minutes - Per Lane	10.4	#DIV/0!	30.9
	Peak 15 Minutes - Total	15.1	#DIV/0!	15.9

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	866.97	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.306451613
	Input	Item	Description		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	397
	Input	Item	Description		
	397	vi	lane group flow rate including initial queue present		
	397	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	264.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	264.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	866.97	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	5.53894372
	Input	Item	Description		
	5.53894372	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.436890204	Q1	first-term queued vehicles (vehicles)		
	0.102053516	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.436890204
	Input	Item	Description		
	5.436890204	Q1	first-term queued vehicles (vehicles)		
	0.98523038	PF2	adjustment factor for effects of progression		
	264.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0.457916652	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.98523038
	Input	Item	Description		
	0.98523038	PF2	adjustment factor for effects of progression		
	264.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.102053516
	Input	Item	Description		
	0.102053516	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.457916652	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	288.99	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.306451613
	Input	Item	Description		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	420
	Input	Item	Description		
	420	vl	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	840
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	840	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	288.99	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	17.57038564
	Input	Item	Description		
	17.57038564	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	9.879753691	Q1	first-term queued vehicles (vehicles)		
	7.690631951	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	9.879753691
	Input	Item	Description		
	9.879753691	Q1	first-term queued vehicles (vehicles)		
	0.423418015	PF2	adjustment factor for effects of progression		
	840	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	1.453337486	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.423418015
	Input	Item	Description		
	0.423418015	PF2	adjustment factor for effects of progression		
	840	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	7.690631951
	Input	Item	Description		
	7.690631951	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	1.453337486	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway EB Off-Ramp (EW) - #17
Saturday Peak Hour

Description	Queue Analysis Left	Queue Analysis Thru	Queue Analysis Right
Lanes	1.5	0	0.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	760.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.38	0.38	0.38
Effective Green Time	38	38	38
Traffic Volume - With PHF	415	0	352
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	5.8	#DIV/0!	14.4
Peak 15 Minutes - Total	8.6	#DIV/0!	7.2

	Description	Left Turn Total Queue Analysis Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	5.8	#DIV/0!	14.4
	Peak 15 Minutes - Total	8.6	#DIV/0!	7.2
70%	Peak 15 Minutes - Per Lane	7.7	#DIV/0!	18.1
	Peak 15 Minutes - Total	11.2	#DIV/0!	9.4
85%	Peak 15 Minutes - Per Lane	8.8	#DIV/0!	20.4
	Peak 15 Minutes - Total	12.7	#DIV/0!	10.7
90%	Peak 15 Minutes - Per Lane	9.4	#DIV/0!	22.0
	Peak 15 Minutes - Total	13.6	#DIV/0!	11.4
95%	Peak 15 Minutes - Per Lane	9.8	#DIV/0!	23.0
	Peak 15 Minutes - Total	14.3	#DIV/0!	12.0
98%	Peak 15 Minutes - Per Lane	10.8	#DIV/0!	25.4
	Peak 15 Minutes - Total	15.7	#DIV/0!	13.2

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	866.97	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.306451613
	Input	Item	Description		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2)))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	415
	Input	Item	Description		
	415	vi	lane group flow rate including initial queue present		
	415	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	276.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	276.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	866.97	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	5.765523494
	Input	Item	Description		
	5.765523494	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.658842867	Q1	first-term queued vehicles (vehicles)		
	0.106680627	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.658842867
	Input	Item	Description		
	5.658842867	Q1	first-term queued vehicles (vehicles)		
	0.971603632	PF2	adjustment factor for effects of progression		
	276.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0.478678616	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.971603632
	Input	Item	Description		
	0.971603632	PF2	adjustment factor for effects of progression		
	276.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2)))))		Equation	Results	0.106680627
	Input	Item	Description		
	0.106680627	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.478678616	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	[illegible]	Qb	lane group initial queue at start of analysis period (vehicles)		
	[illegible]	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	[illegible]	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	288.99	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	[illegible]	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	[illegible]	C	cycle length (seconds)		
	[illegible]	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.306451613
	Input	Item	Description		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	352
	Input	Item	Description		
	352	vl	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	[illegible]	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	704
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	704	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	288.99	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	14.36183761
	Input	Item	Description		
	14.36183761	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	10.54730798	Q1	first-term queued vehicles (vehicles)		
	3.814529635	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	10.54730798
	Input	Item	Description		
	10.54730798	Q1	first-term queued vehicles (vehicles)		
	0.539350976	PF2	adjustment factor for effects of progression		
	704	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	1.218035226	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.539350976
	Input	Item	Description		
	0.539350976	PF2	adjustment factor for effects of progression		
	704	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	3.814529635
	Input	Item	Description		
	3.814529635	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	1.218035226	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway WB Off-Ramp (EW) - #2
Morning Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.54	0.54	0.54
Effective Green Time	54	54	54
Traffic Volume - With PHF	395	0	573
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	4.9	#DIV/0!	6.9
Peak 15 Minutes - Total	7.4	#DIV/0!	10.3

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	4.9	#DIV/0!	6.9
	Peak 15 Minutes - Total	7.4	#DIV/0!	10.3
70%	Peak 15 Minutes - Per Lane	6.8	#DIV/0!	9.1
	Peak 15 Minutes - Total	9.7	#DIV/0!	13.2
85%	Peak 15 Minutes - Per Lane	7.7	#DIV/0!	10.3
	Peak 15 Minutes - Total	11.0	#DIV/0!	14.9
90%	Peak 15 Minutes - Per Lane	8.2	#DIV/0!	11.0
	Peak 15 Minutes - Total	11.8	#DIV/0!	16.0
95%	Peak 15 Minutes - Per Lane	8.6	#DIV/0!	11.5
	Peak 15 Minutes - Total	12.4	#DIV/0!	16.8
98%	Peak 15 Minutes - Per Lane	9.4	#DIV/0!	12.7
	Peak 15 Minutes - Total	13.6	#DIV/0!	18.5

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	395
	Input	Item	Description		
	395	vl	lane group flow rate including initial queue present		
	395	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	263.3333333
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	263.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	4.949022822
	Input	Item	Description		
	4.949022822	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	4.877569176	Q1	first-term queued vehicles (vehicles)		
	0.071453646	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	4.877569176
	Input	Item	Description		
	4.877569176	Q1	first-term queued vehicles (vehicles)		
	1.198611959	PF2	adjustment factor for effects of progression		
	263.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.320614281	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.198611959
	Input	Item	Description		
	1.198611959	PF2	adjustment factor for effects of progression		
	263.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.071453646
	Input	Item	Description		
	0.071453646	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.320614281	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	573
	Input	Item	Description		
	573	vi	lane group flow rate including initial queue present		
	573	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	382
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	382	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	6.877044055
	Input	Item	Description		
	6.877044055	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	6.773391044	Q1	first-term queued vehicles (vehicles)		
	0.103653011	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	6.773391044
	Input	Item	Description		
	6.773391044	Q1	first-term queued vehicles (vehicles)		
	1.039158909	PF2	adjustment factor for effects of progression		
	382	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.465093627	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.039158909
	Input	Item	Description		
	1.039158909	PF2	adjustment factor for effects of progression		
	382	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.103653011
	Input	Item	Description		
	0.103653011	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.465093627	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway WB Off-Ramp (EW) - #2
Evening Peak Hour

Description	Queue Analysis Left	Queue Analysis Thru	Queue Analysis Right
Lanes	1.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.54	0.54	0.54
Effective Green Time	54	54	54
Traffic Volume - With PHF	372	0	334
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	4.7	#DIV/0!	4.2
Peak 15 Minutes - Total	7.0	#DIV/0!	6.4

Description		Left Turn Total Queue Analysis Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	4.7	#DIV/0!	4.2
	Peak 15 Minutes - Total	7.0	#DIV/0!	6.4
70%	Peak 15 Minutes - Per Lane	6.5	#DIV/0!	5.9
	Peak 15 Minutes - Total	9.2	#DIV/0!	8.4
85%	Peak 15 Minutes - Per Lane	7.3	#DIV/0!	6.7
	Peak 15 Minutes - Total	10.5	#DIV/0!	9.6
90%	Peak 15 Minutes - Per Lane	7.8	#DIV/0!	7.2
	Peak 15 Minutes - Total	11.2	#DIV/0!	10.3
95%	Peak 15 Minutes - Per Lane	8.2	#DIV/0!	7.5
	Peak 15 Minutes - Total	11.8	#DIV/0!	10.7
98%	Peak 15 Minutes - Per Lane	9.0	#DIV/0!	8.2
	Peak 15 Minutes - Total	12.9	#DIV/0!	11.8

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)	Equation		Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)	Equation		Results	0
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	821.34
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2	Equation		Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))	Equation		Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)	Equation		Results	372
	Input	Item	Description		
	372	vi	lane group flow rate including initial queue present		
	372	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)	Equation		Results	248
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	821.34
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	248	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2	Equation		Results	4.686200206
	Input	Item	Description		
	4.686200206	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	4.618907152	Q1	first-term queued vehicles (vehicles)		
	0.067293054	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	4.618907152
	Input	Item	Description		
	4.618907152	Q1	first-term queued vehicles (vehicles)		
	1.219920165	PF2	adjustment factor for effects of progression		
	248	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.301945601	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))	Equation		Results	1.219920165
	Input	Item	Description		
	1.219920165	PF2	adjustment factor for effects of progression		
	248	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	0.067293054
	Input	Item	Description		
	0.067293054	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.301945601	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	334
	Input	Item	Description		
	334	vi	lane group flow rate including initial queue present		
	334	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	222.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	222.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	4.245104141
	Input	Item	Description		
	4.245104141	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	4.184685108	Q1	first-term queued vehicles (vehicles)		
	0.060419033	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	4.184685108
	Input	Item	Description		
	4.184685108	Q1	first-term queued vehicles (vehicles)		
	1.255478379	PF2	adjustment factor for effects of progression		
	222.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.271101696	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.255478379
	Input	Item	Description		
	1.255478379	PF2	adjustment factor for effects of progression		
	222.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.060419033
	Input	Item	Description		
	0.060419033	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.271101696	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway WB Off-Ramp (EW) - #2
Saturday Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.54	0.54	0.54
Effective Green Time	54	54	54
Traffic Volume - With PHF	554	0	494
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	6.7	#DIV/0!	6.0
Peak 15 Minutes - Total	10.0	#DIV/0!	9.1

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	6.7	#DIV/0!	6.0
	Peak 15 Minutes - Total	10.0	#DIV/0!	9.1
70%	Peak 15 Minutes - Per Lane	8.8	#DIV/0!	8.1
	Peak 15 Minutes - Total	12.8	#DIV/0!	11.7
85%	Peak 15 Minutes - Per Lane	10.0	#DIV/0!	9.1
	Peak 15 Minutes - Total	14.5	#DIV/0!	13.2
90%	Peak 15 Minutes - Per Lane	10.7	#DIV/0!	9.8
	Peak 15 Minutes - Total	15.6	#DIV/0!	14.2
95%	Peak 15 Minutes - Per Lane	11.2	#DIV/0!	10.3
	Peak 15 Minutes - Total	16.4	#DIV/0!	14.9
98%	Peak 15 Minutes - Per Lane	12.4	#DIV/0!	11.3
	Peak 15 Minutes - Total	18.0	#DIV/0!	16.4

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2)))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	554
	Input	Item	Description		
	554	vi	lane group flow rate including initial queue present		
	554	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	369.3333333
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	369.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	6.680194166
	Input	Item	Description		
	6.680194166	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	6.579978166	Q1	first-term queued vehicles (vehicles)		
	0.100216	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	6.579978166
	Input	Item	Description		
	6.579978166	Q1	first-term queued vehicles (vehicles)		
	1.055718662	PF2	adjustment factor for effects of progression		
	369.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.449671675	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.055718662
	Input	Item	Description		
	1.055718662	PF2	adjustment factor for effects of progression		
	369.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2)))))		Equation	Results	0.100216
	Input	Item	Description		
	0.100216	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.449671675	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	[illegible]	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.586956522
	Input	Item	Description		
	1.586956522	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	494
	Input	Item	Description		
	494	vl	lane group flow rate including initial queue present		
	494	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	329.3333333
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	821.34
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	329.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1232.01	c	lane group capacity (vehicles per hour)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	6.044520032
	Input	Item	Description		
	6.044520032	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.95515775	Q1	first-term queued vehicles (vehicles)		
	0.089362282	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.95515775
	Input	Item	Description		
	5.95515775	Q1	first-term queued vehicles (vehicles)		
	1.108735178	PF2	adjustment factor for effects of progression		
	329.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	54	g	effective green time (seconds)		
	0.400970771	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.108735178
	Input	Item	Description		
	1.108735178	PF2	adjustment factor for effects of progression		
	329.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.089362282
	Input	Item	Description		
	0.089362282	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	821.34	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.400970771	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.27	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	54	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway EB Off-Ramp (EW) - #3
Morning Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0.5	1
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	760.5	1521
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.5	0.5	0.5
Effective Green Time	50	50	50
Traffic Volume - With PHF	469	14	0
Peak Hour - Per Lane	0.0	0.0	0.0
Peak Hour - Total	0.0	0.0	0.0
Peak 15 Minutes - Per Lane	5.9	0.6	0.0
Peak 15 Minutes - Total	8.9	0.3	0.0

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	5.9	0.6	0.0
	Peak 15 Minutes - Total	8.9	0.3	0.0
70%	Peak 15 Minutes - Per Lane	7.9	1.7	1.0
	Peak 15 Minutes - Total	11.5	1.3	1.0
85%	Peak 15 Minutes - Per Lane	9.0	1.8	1.0
	Peak 15 Minutes - Total	13.0	1.4	1.0
90%	Peak 15 Minutes - Per Lane	9.6	1.8	1.0
	Peak 15 Minutes - Total	14.0	1.4	1.0
95%	Peak 15 Minutes - Per Lane	10.1	1.9	1.0
	Peak 15 Minutes - Total	14.6	1.4	1.0
98%	Peak 15 Minutes - Per Lane	11.1	2.0	1.0
	Peak 15 Minutes - Total	16.1	1.5	1.0

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	130	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	469
	Input	Item	Description		
	469	vi	lane group flow rate including initial queue present		
	469	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	312.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	312.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	5.935997267
	Input	Item	Description		
	5.935997267	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.844370176	Q1	first-term queued vehicles (vehicles)		
	0.091627091	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.844370176
	Input	Item	Description		
	5.844370176	Q1	first-term queued vehicles (vehicles)		
	1.069168539	PF2	adjustment factor for effects of progression		
	312.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.411133027	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.069168539
	Input	Item	Description		
	1.069168539	PF2	adjustment factor for effects of progression		
	312.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.091627091
	Input	Item	Description		
	0.091627091	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.411133027	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	14
	Input	Item	Description		
	14	vl	lane group flow rate including initial queue present		
	14	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	28
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	28	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0.58616947
	Input	Item	Description		
	0.58616947	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0.577964059	Q1	first-term queued vehicles (vehicles)		
	0.008205411	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0.577964059
	Input	Item	Description		
	0.577964059	Q1	first-term queued vehicles (vehicles)		
	1.458834049	PF2	adjustment factor for effects of progression		
	28	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.036817883	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.458834049
	Input	Item	Description		
	1.458834049	PF2	adjustment factor for effects of progression		
	28	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.008205411
	Input	Item	Description		
	0.008205411	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.036817883	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway EB Off-Ramp (EW) - #3
Evening Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0.5	1
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	760.5	1521
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.5	0.5	0.5
Effective Green Time	50	50	50
Traffic Volume - With PHF	279	21	0
Peak Hour - Per Lane	0.0	0.0	0.0
Peak Hour - Total	0.0	0.0	0.0
Peak 15 Minutes - Per Lane	3.7	0.9	0.0
Peak 15 Minutes - Total	5.5	0.4	0.0

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	3.7	0.9	0.0
	Peak 15 Minutes - Total	5.5	0.4	0.0
70%	Peak 15 Minutes - Per Lane	5.3	2.0	1.0
	Peak 15 Minutes - Total	7.5	1.5	1.0
85%	Peak 15 Minutes - Per Lane	6.0	2.2	1.0
	Peak 15 Minutes - Total	8.4	1.6	1.0
90%	Peak 15 Minutes - Per Lane	6.4	2.3	1.0
	Peak 15 Minutes - Total	9.0	1.6	1.0
95%	Peak 15 Minutes - Per Lane	6.6	2.3	1.0
	Peak 15 Minutes - Total	9.5	1.7	1.0
98%	Peak 15 Minutes - Per Lane	7.3	2.5	1.0
	Peak 15 Minutes - Total	10.4	1.7	1.0

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	279
	Input	Item	Description		
	279	vl	lane group flow rate including initial queue present		
	279	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	186
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	186	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	3.692574435
	Input	Item	Description		
	3.692574435	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	3.638067061	Q1	first-term queued vehicles (vehicles)		
	0.054507374	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	3.638067061
	Input	Item	Description		
	3.638067061	Q1	first-term queued vehicles (vehicles)		
	1.236067831	PF2	adjustment factor for effects of progression		
	186	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.244575937	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.236067831
	Input	Item	Description		
	1.236067831	PF2	adjustment factor for effects of progression		
	186	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.054507374
	Input	Item	Description		
	0.054507374	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.244575937	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	21
	Input	Item	Description		
	21	vi	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	42
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	42	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0.875227249
	Input	Item	Description		
	0.875227249	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0.862919132	Q1	first-term queued vehicles (vehicles)		
	0.012308117	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0.862919132
	Input	Item	Description		
	0.862919132	Q1	first-term queued vehicles (vehicles)		
	1.438441698	PF2	adjustment factor for effects of progression		
	42	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.055226824	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.438441698
	Input	Item	Description		
	1.438441698	PF2	adjustment factor for effects of progression		
	42	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.012308117
	Input	Item	Description		
	0.012308117	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.055226824	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)	Equation		Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)	Equation		Results	0
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	760.5
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2	Equation		Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))	Equation		Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)	Equation		Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)	Equation		Results	0
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	760.5
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2	Equation		Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))	Equation		Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Fullerton Road (NS) at SR-60 Freeway EB Off-Ramp (EW) - #3
Saturday Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0.5	1
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	760.5	1521
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.5	0.5	0.5
Effective Green Time	50	50	50
Traffic Volume - With PHF	354	71	0
Peak Hour - Per Lane	0.0	0.0	0.0
Peak Hour - Total	0.0	0.0	0.0
Peak 15 Minutes - Per Lane	4.6	2.9	0.0
Peak 15 Minutes - Total	6.9	1.4	0.0

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	4.6	2.9	0.0
	Peak 15 Minutes - Total	6.9	1.4	0.0
70%	Peak 15 Minutes - Per Lane	6.4	4.3	1.0
	Peak 15 Minutes - Total	9.1	2.7	1.0
85%	Peak 15 Minutes - Per Lane	7.2	4.8	1.0
	Peak 15 Minutes - Total	10.3	2.9	1.0
90%	Peak 15 Minutes - Per Lane	7.7	5.1	1.0
	Peak 15 Minutes - Total	11.0	3.1	1.0
95%	Peak 15 Minutes - Per Lane	8.0	5.4	1.0
	Peak 15 Minutes - Total	11.6	3.2	1.0
98%	Peak 15 Minutes - Per Lane	8.8	5.9	1.0
	Peak 15 Minutes - Total	12.7	3.4	1.0

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	354
	Input	Item	Description		
	354	vi	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	236
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	236	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	1140.75	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	4.60438891
	Input	Item	Description		
	4.60438891	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	4.535229016	Q1	first-term queued vehicles (vehicles)		
	0.069159894	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	4.535229016
	Input	Item	Description		
	4.535229016	Q1	first-term queued vehicles (vehicles)		
	1.168943794	PF2	adjustment factor for effects of progression		
	236	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.310322156	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.168943794
	Input	Item	Description		
	1.168943794	PF2	adjustment factor for effects of progression		
	236	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.069159894
	Input	Item	Description		
	0.069159894	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.310322156	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	71
	Input	Item	Description		
	71	vl	lane group flow rate including initial queue present		
	71	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	142
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	142	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	380.25	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	2.861852034
	Input	Item	Description		
	2.861852034	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	2.820238878	Q1	first-term queued vehicles (vehicles)		
	0.041613156	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	2.820238878
	Input	Item	Description		
	2.820238878	Q1	first-term queued vehicles (vehicles)		
	1.296477844	PF2	adjustment factor for effects of progression		
	142	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0.186719264	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.296477844
	Input	Item	Description		
	1.296477844	PF2	adjustment factor for effects of progression		
	142	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.041613156
	Input	Item	Description		
	0.041613156	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.186719264	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	760.5
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	760.5	c	lane group capacity (vehicles per hour)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	50	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.5
	Input	Item	Description		
	1.5	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	760.5	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.25	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	50	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway WB Off-Ramp (EW) - #16
Morning Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	0.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	760.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.4	0.4	0.4
Effective Green Time	40	40	40
Traffic Volume - With PHF	291	0	680
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	10.7	#DIV/0!	8.7
Peak 15 Minutes - Total	5.3	#DIV/0!	13.1

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	10.7	#DIV/0!	8.7
	Peak 15 Minutes - Total	5.3	#DIV/0!	13.1
70%	Peak 15 Minutes - Per Lane	13.6	#DIV/0!	11.3
	Peak 15 Minutes - Total	7.2	#DIV/0!	16.5
85%	Peak 15 Minutes - Per Lane	15.4	#DIV/0!	12.8
	Peak 15 Minutes - Total	8.2	#DIV/0!	18.7
90%	Peak 15 Minutes - Per Lane	16.6	#DIV/0!	13.7
	Peak 15 Minutes - Total	8.7	#DIV/0!	20.2
95%	Peak 15 Minutes - Per Lane	17.4	#DIV/0!	14.4
	Peak 15 Minutes - Total	9.2	#DIV/0!	21.1
98%	Peak 15 Minutes - Per Lane	19.1	#DIV/0!	15.9
	Peak 15 Minutes - Total	10.1	#DIV/0!	23.3

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	608.4
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	304.2	c	lane group capacity (vehicles per hour)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.333333333	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.333333333
	Input	Item	Description		
	1.333333333	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	291
	Input	Item	Description		
	291	vi	lane group flow rate including initial queue present		
	291	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	582
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	608.4
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	582	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	304.2	c	lane group capacity (vehicles per hour)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	10.67210278
	Input	Item	Description		
	10.67210278	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	10.45890861	Q1	first-term queued vehicles (vehicles)		
	0.213194164	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	10.45890861
	Input	Item	Description		
	10.45890861	Q1	first-term queued vehicles (vehicles)		
	0.66565778	PF2	adjustment factor for effects of progression		
	582	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	0.956607495	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.66565778
	Input	Item	Description		
	0.66565778	PF2	adjustment factor for effects of progression		
	582	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.213194164
	Input	Item	Description		
	0.213194164	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.956607495	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	608.4
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	912.6	c	lane group capacity (vehicles per hour)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		

Determination of Back of Queue

G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.333333333	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.333333333
	Input	Item	Description		
	1.333333333	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	680
	Input	Item	Description		
	680	vl	lane group flow rate including initial queue present		
	680	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	453.3333333
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	608.4
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	453.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	912.6	c	lane group capacity (vehicles per hour)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		

Determination of Back of Queue

G16-6	Q=Q1+Q2		Equation	Results	8.738849451
	Input	Item	Description		
	8.738849451	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	8.572787559	Q1	first-term queued vehicles (vehicles)		
	0.166061892	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	8.572787559
	Input	Item	Description		
	8.572787559	Q1	first-term queued vehicles (vehicles)		
	0.796456623	PF2	adjustment factor for effects of progression		
	453.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	40	g	effective green time (seconds)		
	0.745123822	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.796456623
	Input	Item	Description		
	0.796456623	PF2	adjustment factor for effects of progression		
	453.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.166061892
	Input	Item	Description		
	0.166061892	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	608.4	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.745123822	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.2	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	40	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway WB Off-Ramp (EW) - #16
Evening Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	0.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	760.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.33	0.33	0.33
Effective Green Time	33	33	33
Traffic Volume - With PHF	384	0	340
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	18.8	#DIV/0!	5.0
Peak 15 Minutes - Total	9.4	#DIV/0!	7.4

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	18.8	#DIV/0!	5.0
	Peak 15 Minutes - Total	9.4	#DIV/0!	7.4
70%	Peak 15 Minutes - Per Lane	23.6	#DIV/0!	6.8
	Peak 15 Minutes - Total	12.1	#DIV/0!	9.7
85%	Peak 15 Minutes - Per Lane	26.6	#DIV/0!	7.7
	Peak 15 Minutes - Total	13.7	#DIV/0!	11.0
90%	Peak 15 Minutes - Per Lane	28.7	#DIV/0!	8.2
	Peak 15 Minutes - Total	14.7	#DIV/0!	11.8
95%	Peak 15 Minutes - Per Lane	29.9	#DIV/0!	8.6
	Peak 15 Minutes - Total	15.4	#DIV/0!	12.4
98%	Peak 15 Minutes - Per Lane	33.0	#DIV/0!	9.4
	Peak 15 Minutes - Total	17.0	#DIV/0!	13.7

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)	Equation		Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)	Equation		Results	0
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	501.93
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	[illegible]	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2	Equation		Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))	Equation		Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.12I0(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)	Equation		Results	384
	Input	Item	Description		
	384	vl	lane group flow rate including initial queue present		
	384	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)	Equation		Results	768
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	501.93
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	768	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2	Equation		Results	18.79440152
	Input	Item	Description		
	18.79440152	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	9.839372554	Q1	first-term queued vehicles (vehicles)		
	8.955028963	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	9.839372554
	Input	Item	Description		
	9.839372554	Q1	first-term queued vehicles (vehicles)		
	0.461220588	PF2	adjustment factor for effects of progression		
	768	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	1.530093838	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))	Equation		Results	0.461220588
	Input	Item	Description		
	0.461220588	PF2	adjustment factor for effects of progression		
	768	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	8.955028963
	Input	Item	Description		
	8.955028963	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	1.530093838	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.12I0(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	340
	Input	Item	Description		
	340	vl	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	226.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	226.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	4.966309028
	Input	Item	Description		
	4.966309028	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	4.865665457	Q1	first-term queued vehicles (vehicles)		
	0.100643571	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	4.865665457
	Input	Item	Description		
	4.865665457	Q1	first-term queued vehicles (vehicles)		
	0.981520121	PF2	adjustment factor for effects of progression		
	226.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0.451590195	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	0.981520121
	Input	Item	Description		
	0.981520121	PF2	adjustment factor for effects of progression		
	226.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.100643571
	Input	Item	Description		
	0.100643571	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.451590195	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway WB Off-Ramp (EW) - #16
Saturday Peak Hour

Description	Queue Analysis Left	Queue Analysis Thru	Queue Analysis Right
Lanes	0.5	0	1.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	760.5	0	2281.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.33	0.33	0.33
Effective Green Time	33	33	33
Traffic Volume - With PHF	436	0	517
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	21.6	#DIV/0!	7.2
Peak 15 Minutes - Total	10.8	#DIV/0!	10.9

Description		Left Turn Total Queue Analysis Northbound	Left Turn Total Queue Analysis Southbound	Left Turn Total Queue Analysis Westbound
50%	Peak 15 Minutes - Per Lane	21.6	#DIV/0!	7.2
	Peak 15 Minutes - Total	10.8	#DIV/0!	10.9
70%	Peak 15 Minutes - Per Lane	27.2	#DIV/0!	9.5
	Peak 15 Minutes - Total	13.7	#DIV/0!	13.8
85%	Peak 15 Minutes - Per Lane	30.4	#DIV/0!	10.8
	Peak 15 Minutes - Total	15.6	#DIV/0!	15.7
90%	Peak 15 Minutes - Per Lane	32.9	#DIV/0!	11.5
	Peak 15 Minutes - Total	16.7	#DIV/0!	16.9
95%	Peak 15 Minutes - Per Lane	34.2	#DIV/0!	12.1
	Peak 15 Minutes - Total	17.5	#DIV/0!	17.7
98%	Peak 15 Minutes - Per Lane	37.6	#DIV/0!	13.3
	Peak 15 Minutes - Total	19.3	#DIV/0!	19.5

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	436
	Input	Item	Description		
	436	vl	lane group flow rate including initial queue present		
	436	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	872
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	872	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	21.55664743
	Input	Item	Description		
	21.55664743	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	9.188437463	Q1	first-term queued vehicles (vehicles)		
	12.36820997	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	9.188437463
	Input	Item	Description		
	9.188437463	Q1	first-term queued vehicles (vehicles)		
	0.379339161	PF2	adjustment factor for effects of progression		
	872	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	1.737294045	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	0.379339161
	Input	Item	Description		
	0.379339161	PF2	adjustment factor for effects of progression		
	872	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	12.36820997
	Input	Item	Description		
	12.36820997	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	1.737294045	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		

Determination of Back of Queue

G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	517
	Input	Item	Description		
	517	vl	lane group flow rate including initial queue present		
	517	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	344.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	344.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		

Determination of Back of Queue

G16-6	Q=Q1+Q2		Equation	Results	7.241608018
	Input	Item	Description		
	7.241608018	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	7.088570588	Q1	first-term queued vehicles (vehicles)		
	0.15303743	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	7.088570588
	Input	Item	Description		
	7.088570588	Q1	first-term queued vehicles (vehicles)		
	0.854649951	PF2	adjustment factor for effects of progression		
	344.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0.686682738	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.854649951
	Input	Item	Description		
	0.854649951	PF2	adjustment factor for effects of progression		
	344.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.15303743
	Input	Item	Description		
	0.15303743	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.686682738	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway EB Off-Ramp (EW) - #17
Morning Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0	0.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	760.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.33	0.33	0.33
Effective Green Time	33	33	33
Traffic Volume - With PHF	401	0	243
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	5.8	#DIV/0!	9.7
Peak 15 Minutes - Total	8.7	#DIV/0!	4.8

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	5.8	#DIV/0!	9.7
	Peak 15 Minutes - Total	8.7	#DIV/0!	4.8
70%	Peak 15 Minutes - Per Lane	7.7	#DIV/0!	12.4
	Peak 15 Minutes - Total	11.2	#DIV/0!	6.6
85%	Peak 15 Minutes - Per Lane	8.8	#DIV/0!	14.1
	Peak 15 Minutes - Total	12.7	#DIV/0!	7.5
90%	Peak 15 Minutes - Per Lane	9.4	#DIV/0!	15.1
	Peak 15 Minutes - Total	13.6	#DIV/0!	8.0
95%	Peak 15 Minutes - Per Lane	9.8	#DIV/0!	15.8
	Peak 15 Minutes - Total	14.3	#DIV/0!	8.4
98%	Peak 15 Minutes - Per Lane	10.8	#DIV/0!	17.5
	Peak 15 Minutes - Total	15.7	#DIV/0!	9.2

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)	Equation		Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)	Equation		Results	0
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	501.93
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2	Equation		Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))	Equation		Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)	Equation		Results	401
	Input	Item	Description		
	401	vl	lane group flow rate including initial queue present		
	[illegible]	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)	Equation		Results	267.3333333
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	501.93
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	267.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	752.895	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2	Equation		Results	5.774430563
	Input	Item	Description		
	5.774430563	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.655730351	Q1	first-term queued vehicles (vehicles)		
	0.118700212	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	5.655730351
	Input	Item	Description		
	5.655730351	Q1	first-term queued vehicles (vehicles)		
	0.936949415	PF2	adjustment factor for effects of progression		
	267.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0.532610789	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))	Equation		Results	0.936949415
	Input	Item	Description		
	0.936949415	PF2	adjustment factor for effects of progression		
	267.3333333	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	0.118700212
	Input	Item	Description		
	0.118700212	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.532610789	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))(1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.246268657
	Input	Item	Description		
	1.246268657	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	243
	Input	Item	Description		
	243	vl	lane group flow rate including initial queue present		
	243	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	486
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	501.93
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	486	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	250.965	c	lane group capacity (vehicles per hour)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	9.687359704
	Input	Item	Description		
	9.687359704	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	9.471568047	Q1	first-term queued vehicles (vehicles)		
	0.215791657	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	9.471568047
	Input	Item	Description		
	9.471568047	Q1	first-term queued vehicles (vehicles)		
	0.712564937	PF2	adjustment factor for effects of progression		
	486	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	33	g	effective green time (seconds)		
	0.968262507	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.712564937
	Input	Item	Description		
	0.712564937	PF2	adjustment factor for effects of progression		
	486	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.215791657
	Input	Item	Description		
	0.215791657	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	501.93	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.968262507	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.165	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	33	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway EB Off-Ramp (EW) - #17
Evening Peak Hour

Description	Queue Analysis Left	Queue Analysis Thru	Queue Analysis Right
Lanes	1.5	0	0.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	760.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.38	0.38	0.38
Effective Green Time	38	38	38
Traffic Volume - With PHF	397	0	420
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	5.5	#DIV/0!	17.6
Peak 15 Minutes - Total	8.3	#DIV/0!	8.8

Description		Left Turn Total Queue Analysis Northbound	Left Turn Total Queue Analysis Southbound	Left Turn Total Queue Analysis Westbound
50%	Peak 15 Minutes - Per Lane	5.5	#DIV/0!	17.6
	Peak 15 Minutes - Total	8.3	#DIV/0!	8.8
70%	Peak 15 Minutes - Per Lane	7.5	#DIV/0!	22.1
	Peak 15 Minutes - Total	10.8	#DIV/0!	11.3
85%	Peak 15 Minutes - Per Lane	8.4	#DIV/0!	24.9
	Peak 15 Minutes - Total	12.2	#DIV/0!	12.8
90%	Peak 15 Minutes - Per Lane	9.0	#DIV/0!	26.8
	Peak 15 Minutes - Total	13.1	#DIV/0!	13.8
95%	Peak 15 Minutes - Per Lane	9.5	#DIV/0!	28.0
	Peak 15 Minutes - Total	13.7	#DIV/0!	14.5
98%	Peak 15 Minutes - Per Lane	10.4	#DIV/0!	30.9
	Peak 15 Minutes - Total	15.1	#DIV/0!	15.9

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	866.97	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.306451613
	Input	Item	Description		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	397
	Input	Item	Description		
	397	vi	lane group flow rate including initial queue present		
	397	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	264.6666667
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	264.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	866.97	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	5.53894372
	Input	Item	Description		
	5.53894372	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.436890204	Q1	first-term queued vehicles (vehicles)		
	0.102053516	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	5.436890204
	Input	Item	Description		
	5.436890204	Q1	first-term queued vehicles (vehicles)		
	0.98523038	PF2	adjustment factor for effects of progression		
	264.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0.457916652	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.98523038
	Input	Item	Description		
	0.98523038	PF2	adjustment factor for effects of progression		
	264.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0.102053516
	Input	Item	Description		
	0.102053516	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.457916652	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	288.99	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.306451613
	Input	Item	Description		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	420
	Input	Item	Description		
	420	vi	lane group flow rate including initial queue present		
	420	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	840
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	840	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	288.99	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
	Determination of Back of Queue				
G16-6	Q=Q1+Q2		Equation	Results	17.57038564
	Input	Item	Description		
	17.57038564	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	9.879753691	Q1	first-term queued vehicles (vehicles)		
	7.690631951	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	9.879753691
	Input	Item	Description		
	9.879753691	Q1	first-term queued vehicles (vehicles)		
	0.423418015	PF2	adjustment factor for effects of progression		
	840	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	1.453337486	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.423418015
	Input	Item	Description		
	0.423418015	PF2	adjustment factor for effects of progression		
	840	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	7.690631951
	Input	Item	Description		
	7.690631951	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	1.453337486	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual Average Back of Queue Analysis
Nogales Street (NS) at SR-60 Freeway EB Off-Ramp (EW) - #17
Saturday Peak Hour

Description	Queue Analysis		
	Left	Thru	Right
Lanes	1.5	0	0.5
Lane Capacity	1700	1700	1700
Capacity Adjustment	0.8947368	0.8947368	0.8947368
Adjusted Capacity	1521	1521	1521
Total Capacity	2281.5	0	760.5
Signal Cycle Length	100	100	100
Percent Green of Cycle	0.38	0.38	0.38
Effective Green Time	38	38	38
Traffic Volume - With PHF	415	0	352
Peak Hour - Per Lane	0.0	#DIV/0!	0.0
Peak Hour - Total	0.0	#DIV/0!	0.0
Peak 15 Minutes - Per Lane	5.8	#DIV/0!	14.4
Peak 15 Minutes - Total	8.6	#DIV/0!	7.2

Description		Left Turn Total Queue Analysis		
		Northbound	Southbound	Westbound
50%	Peak 15 Minutes - Per Lane	5.8	#DIV/0!	14.4
	Peak 15 Minutes - Total	8.6	#DIV/0!	7.2
70%	Peak 15 Minutes - Per Lane	7.7	#DIV/0!	18.1
	Peak 15 Minutes - Total	11.2	#DIV/0!	9.4
85%	Peak 15 Minutes - Per Lane	8.8	#DIV/0!	20.4
	Peak 15 Minutes - Total	12.7	#DIV/0!	10.7
90%	Peak 15 Minutes - Per Lane	9.4	#DIV/0!	22.0
	Peak 15 Minutes - Total	13.6	#DIV/0!	11.4
95%	Peak 15 Minutes - Per Lane	9.8	#DIV/0!	23.0
	Peak 15 Minutes - Total	14.3	#DIV/0!	12.0
98%	Peak 15 Minutes - Per Lane	10.8	#DIV/0!	25.4
	Peak 15 Minutes - Total	15.7	#DIV/0!	13.2

Highway Capacity Manual 2000 - Northbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)	Equation		Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)	Equation		Results	0
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	577.98
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	866.97	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2	Equation		Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))	Equation		Results	1.306451613
	Input	Item	Description		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)	Equation		Results	415
	Input	Item	Description		
	415	vi	lane group flow rate including initial queue present		
	415	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)	Equation		Results	276.6666667
G16-3	sL=(s/NLG)	Equation		Results	1521
G-16-4	cL=(c/NLG)	Equation		Results	577.98
G-16-5	QbL=(Qb/NLG)	Equation		Results	0
	Input	Item	Description		
	276.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	2281.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	866.97	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	1.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2	Equation		Results	5.765523494
	Input	Item	Description		
	5.765523494	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	5.658842867	Q1	first-term queued vehicles (vehicles)		
	0.106680627	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))	Equation		Results	5.658842867
	Input	Item	Description		
	5.658842867	Q1	first-term queued vehicles (vehicles)		
	0.971603632	PF2	adjustment factor for effects of progression		
	276.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0.478678616	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))	Equation		Results	0.971603632
	Input	Item	Description		
	0.971603632	PF2	adjustment factor for effects of progression		
	276.6666667	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))	Equation		Results	0.106680627
	Input	Item	Description		
	0.106680627	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	0.478678616	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)	Equation - pretimed signal		Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)	Equation - actuated signal		Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)	Equation		Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Southbound

Determination of Back of Queue - Peak Hour

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vl=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vl	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vl/NLG)		Equation	Results	#DIV/0!
G16-3	sL=(s/NLG)		Equation	Results	#DIV/0!
G-16-4	cL=(c/NLG)		Equation	Results	#DIV/0!
G-16-5	QbL=(Qb/NLG)		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	0	s	lane group saturation flow rate (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	0	c	lane group capacity (vehicles per hour)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	#DIV/0!	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q1	first-term queued vehicles (vehicles)		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	#DIV/0!	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	PF2	adjustment factor for effects of progression		
	#DIV/0!	vL	lane group flow rate per lane (vehicles per hour)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	#DIV/0!	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	#DIV/0!	XL	vL/cL ratio		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals		
	#DIV/0!	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3660)^0.7)		Equation - pretimed signal	Results	#DIV/0!
G-16-10 - A	kB=0.1210I(((sLg)/3660)^0.6)		Equation - actuated signal	Results	#DIV/0!
	Input	Item	Description		
	#DIV/0!	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	#DIV/0!	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Highway Capacity Manual 2000 - Westbound

Determination of Back of Queue - Peak Hour

G16-1	vi=v+(Qb/T)		Equation	Results	0
	Input	Item	Description		
	0	vi	lane group flow rate including initial queue present		
	0	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	1	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	0
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	288.99	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	0
	Input	Item	Description		
	0	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	0	Q1	first-term queued vehicles (vehicles)		
	0	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	0
	Input	Item	Description		
	0	Q1	first-term queued vehicles (vehicles)		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	0	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	1.306451613
	Input	Item	Description		
	1.306451613	PF2	adjustment factor for effects of progression		
	0	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	0
	Input	Item	Description		
	0	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	1	T	length of analysis period (hours)		
	0	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

Determination of Back of Queue - Peak 15 Minutes

G16-1	vi=v+(Qb/T)		Equation	Results	352
	Input	Item	Description		
	352	vi	lane group flow rate including initial queue present		
	352	v	arrival flow rate (vehicles per hour)		
	0	Qb	lane group initial queue at start of analysis period (vehicles)		
	0.25	T	length of analysis period (hours)		
G16-2	vL=(vi/NLG)		Equation	Results	704
G16-3	sL=(s/NLG)		Equation	Results	1521
G-16-4	cL=(c/NLG)		Equation	Results	577.98
G-16-5	QbL=(Qb/NLG)		Equation	Results	0
	Input	Item	Description		
	704	vL	lane group flow rate per lane (vehicles per hour)		
	760.5	s	lane group saturation flow rate (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	288.99	c	lane group capacity (vehicles per hour)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0	QbL	lane group initial queue at start of analysis period per lane (vehicles)		
	0.5	NLG	number of lanes in lane group		
			Determination of Back of Queue		
G16-6	Q=Q1+Q2		Equation	Results	14.36183761
	Input	Item	Description		
	14.36183761	Q	maximum distance in vehicles over which queue extends from stop line on average signal cycle (vehicles)		
	10.54730798	Q1	first-term queued vehicles (vehicles)		
	3.814529635	Q2	second-term queued vehicles (vehicles)		
G16-7	Q1=PF2(((vLC/3600)(1-(g/C))/(1-(min(1.0,XL)(g/C)))		Equation	Results	10.54730798
	Input	Item	Description		
	10.54730798	Q1	first-term queued vehicles (vehicles)		
	0.539350976	PF2	adjustment factor for effects of progression		
	704	vL	lane group flow rate per lane (vehicles per hour)		
	100	C	cycle length (seconds)		
	38	g	effective green time (seconds)		
	1.218035226	XL	ratio of flow rate to capacity (vL/cL ratio)		
G16-8	PF2=(1-Rp(g/C))(1-(vL/sL))/(1-(g/C))((1-(Rp)(vL/sL))		Equation	Results	0.539350976
	Input	Item	Description		
	0.539350976	PF2	adjustment factor for effects of progression		
	704	vL	lane group flow rate per lane (vehicles per hour)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		
	0.5	Rp	platoon ratio (P/(C/g)) (Highway Capacity Manual Chapter 16 Page 5)		
G16-9	Q2=0.25cLT((XL-1)+(sqrt((XL-1)^2)+(((8kBXL)/cLT)+((16kBQbL)/((cLT)^2))))		Equation	Results	3.814529635
	Input	Item	Description		
	3.814529635	Q2	second-term of queued vehicles, estimate for average overflow queue (vehicles)		
	577.98	cL	lane group capacity per lane (vehicles per hour)		
	0.25	T	length of analysis period (hours)		
	1.218035226	XL	vL/cL ratio		
	0.111432414	kB	second-term adjustment factor related to early arrivals		
	0	QbL	initial queue at start of analysis period (vehicles)		
	130	cL	cycle length (seconds)		
G-16-10 - P	kB=0.12I(((sLg)/3600)^0.7)		Equation - pretimed signal	Results	0.152826866
G-16-10 - A	kB=0.1210I(((sLg)/3600)^0.6)		Equation - actuated signal	Results	0.111432414
	Input	Item	Description		
	0.111432414	kB	second-term adjustment factor related to early arrivals (used actuated signal equation)		
	1521	sL	lane group saturation flow rate per lane (vehicles per hour)		
	9	g	effective green time (seconds)		
	0.5	I	upstream filtering factor for platoon arrivals (Highway Capacity Manual Chapter 15 Page 8)		
16-1	Rp=P/(g/C)		Equation	Results	0.500
	Input	Item	Description		
	0.5	RP	platoon ratio		
	0.19	P	proportion of all vehicles in movement arriving during green phase (not to exceed 1)		
	38	g	effective green time (seconds)		
	100	C	cycle length (seconds)		

APPENDIX H

California Department of Transportation
Highway Capacity Manual Level of Service Calculations

EXPLANATION AND CALCULATION OF INTERSECTION LEVEL OF SERVICE USING DELAY METHODOLOGY

The levels of service at the unsignalized and signalized intersections are calculated using the delay methodology in the 2000 Highway Capacity Manual. This methodology views an intersection as consisting of several lane groups. A lane group is a set of lanes serving a movement. If there are two northbound left turn lanes, then the lane group serving the northbound left turn movement has two lanes. Similarly, there may be three lanes in the lane group serving the northbound through movement, one lane in the lane group serving the northbound right turn movement, and so forth. It is also possible for one lane to serve two lane groups. A shared lane might result in there being 1.5 lanes in the northbound left turn lane group and 2.5 lanes in the northbound through lane group.

For each lane group, there is a capacity. That capacity is calculated by multiplying the number of lanes in the lane group times a theoretical maximum lane capacity per lane times 12 adjustment factors.

Each of the 12 adjustment factors has a value of approximately 1.00. A value less than 1.00 is generally assigned when a less than desirable condition occurs.

The 12 adjustment factors are as follows:

1. Peak hour factor (to account for peaking within the peak hour)
2. Lane utilization factor (to account for not all lanes loading equally)
3. Lane width
4. Percent of heavy trucks
5. Approach grade
6. Parking
7. Bus stops at intersections
8. Area type (CBD or other)
9. Right turns
10. Left turns

11. Pedestrian activity

12. Signal progression

The maximum theoretical lane capacity and the 12 adjustment factors for it are all unknowns for which approximate estimates have been recommended in the 2000 Highway Capacity Manual. For the most part, the recommended values are not based on statistical analysis but rather on educated estimates. However, it is possible to use the delay method and get reasonable results as will be discussed below.

Once the lane group volume is known and the lane group capacity is known, a volume to capacity ratio can be calculated for the lane group.

With a volume to capacity ratio calculated, average delay per vehicle in a lane group can be estimated. The average delay per vehicle in a lane group is calculated using a complex formula provided by the 2000 Highway Capacity Manual, which can be simplified and described as follows:

Delay per vehicle in a lane group is a function of the following:

1. Cycle length

2. Amount of red time faced by a lane group

3. Amount of yellow time for that lane group

4. The volume to capacity ratio of the lane group

The average delay per vehicle for each lane group is calculated, and eventually an overall average delay for all vehicles entering the intersection is calculated. This average delay per vehicle is then used to judge Level of Service. The Level of Services are defined in the table that follows this discussion.

Experience has shown that when a maximum lane capacity of 1,900 vehicles per hour is used (as recommended in the 2000 Highway Capacity Manual), little or no yellow time penalty is used, and none of the 12 penalty factors are applied, calculated delay is realistic. The delay calculation for instance assumes that yellow time is totally unused. Yet experience shows that most of the yellow time is used.

An idiosyncrasy of the delay methodology is that it is possible to add traffic to an intersection and reduce the average total delay per vehicle. If the average total delay is 30 seconds per vehicle for all vehicles traveling through an intersection, and traffic is

added to a movement that has an average total delay of 15 seconds per vehicle, then the overall average total delay is reduced.
The delay calculation for a lane group is based on a concept that the delay is a function of the amount of unused capacity available. As the volume approaches capacity and there is no more unused capacity available, then the delay rapidly increases. Delay is not proportional to volume, but rather increases rapidly as the unused capacity approaches zero.

Because delay is not linearly related to volumes, the delay does not reflect how close an intersection is to overloading. If an intersection is operating at Level of Service C and has an average total delay of 18 seconds per vehicle, you know very little as to what percent the traffic can increase before Level of Service D is reached.

LEVEL OF SERVICE DESCRIPTION[1]

Level of Service	Description	Average Total Delay Per Vehicle (Seconds)	
		Signalized	Unsignalized
A	Level of Service A occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0 to 10.00	0 to 10.00
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average total delay.	10.01 to 20.00	10.01 to 15.00
C	Level of Service C generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	20.01 to 35.00	15.01 to 25.00
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.01 to 55.00	25.01 to 35.00
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.	55.01 to 80.00	35.01 to 50.00
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	80.01 and up	50.01 and up

[1] Source: Highway Capacity Manual Special Report 209, Transportation Research Board, National Research Council, Washington, D.C., 2000.

Existing

Rowland Heights Plaza
Existing
Weekday Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2

Cycle (sec):	100	Critical Vol./Cap.(X):	0.529
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	20.3
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Fullerton Road						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Include			Include			Include		
Min. Green:	0	7	7	0	7	0	0	0	0	7	0	7
Lanes:	0 0	3 0	1	0 0	3 0	0	0 0	0 0	0	1 0	1! 0	1
Volume Module:												
Base Vol:	0	1004	323	0	604	0	0	0	0	391	0	573
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1004	323	0	604	0	0	0	0	391	0	573
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.00	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	0	1069	0	0	643	0	0	0	0	416	0	610
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1069	0	0	643	0	0	0	0	416	0	610
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1069	0	0	643	0	0	0	0	416	0	610
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.75	1.00	0.75
Lanes:	0.00	3.00	1.00	0.00	3.00	0.00	0.00	0.00	0.00	1.41	0.00	1.59
Final Sat.:	0	5187	1900	0	5187	0	0	0	0	1995	0	2263
Capacity Analysis Module:												
Vol/Sat:	0.00	0.21	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.21	0.00	0.27
Crit Moves:		****										****
Green/Cycle:	0.00	0.39	0.00	0.00	0.39	0.00	0.00	0.00	0.00	0.51	0.00	0.51
Volume/Cap:	0.00	0.53	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.41	0.00	0.53
Delay/Veh:	0.0	23.7	0.0	0.0	21.3	0.0	0.0	0.0	0.0	15.3	0.0	16.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	23.7	0.0	0.0	21.3	0.0	0.0	0.0	0.0	15.3	0.0	16.7
LOS by Move:	A	C	A	A	C	A	A	A	A	B	A	B
HCM2kAvgQ:	0	9	0	0	5	0	0	0	0	6	0	8

Note: Queue reported is the number of cars per lane.

Rowland Heights Plaza
Existing
Weekday Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2

Cycle (sec):	100	Critical Vol./Cap.(X):	0.423
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	17.5
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Fullerton Road						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Include			Include			Include		
Min. Green:	0	7	7	0	7	0	0	0	0	7	0	7
Lanes:	0 0	3	0 1	0 0	3	0 0	0 0	0	0 0	1 0	1!	0 1
Volume Module:												
Base Vol:	0	709	532	0	1049	0	0	0	0	368	0	334
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	709	532	0	1049	0	0	0	0	368	0	334
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.00	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	0	721	0	0	1067	0	0	0	0	374	0	340
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	721	0	0	1067	0	0	0	0	374	0	340
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	721	0	0	1067	0	0	0	0	374	0	340
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.74	1.00	0.74
Lanes:	0.00	3.00	1.00	0.00	3.00	0.00	0.00	0.00	0.00	1.52	0.00	1.48
Final Sat.:	0	5187	1900	0	5187	0	0	0	0	2142	0	2074
Capacity Analysis Module:												
Vol/Sat:	0.00	0.14	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.17	0.00	0.16
Crit Moves:					****					****		
Green/Cycle:	0.00	0.49	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.41	0.00	0.41
Volume/Cap:	0.00	0.29	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.42	0.00	0.40
Delay/Veh:	0.0	15.4	0.0	0.0	16.7	0.0	0.0	0.0	0.0	21.0	0.0	20.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	15.4	0.0	0.0	16.7	0.0	0.0	0.0	0.0	21.0	0.0	20.7
LOS by Move:	A	B	A	A	B	A	A	A	A	C	A	C
HCM2kAvgQ:	0	5	0	0	8	0	0	0	0	6	0	5

Note: Queue reported is the number of cars per lane.

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--------------------------------------------------------------------------------
                        Rowland Heights Plaza
                              Existing
                         Saturday Peak Hour
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                  Level Of Service Computation Report
         2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):         0.544
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):        20.4
Optimal Cycle:       100               Level Of Service:                  C
********************************************************************************
Street Name:          Fullerton Road              SR-60 Freeway WB Ramps
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Ignore          Include          Include          Include
Min. Green:     0    7    7    0    7    0    0    0    0    7    0    7
Lanes:        0  0  3  0  1   0  0  3  0  0   0  0  0  0  0   1  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  744   579    0 1097     0    0    0     0  549    0   494
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0  744   579    0 1097     0    0    0     0  549    0   494
User Adj:    1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.00 0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96
PHF Volume:     0  778     0    0 1147     0    0    0     0  574    0   517
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0  778     0    0 1147     0    0    0     0  574    0   517
PCE Adj:     1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0  778     0    0 1147     0    0    0     0  574    0   517
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.91  1.00 1.00 0.91  1.00 1.00 1.00  1.00 0.74 1.00  0.74
Lanes:       0.00 3.00  1.00 0.00 3.00  0.00 0.00 0.00  0.00 1.53 0.00  1.47
Final Sat.:     0 5187  1900    0 5187     0    0    0     0 2142    0  2068
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.15  0.00 0.00 0.22  0.00 0.00 0.00  0.00 0.27 0.00  0.25
Crit Moves:                       ****                          ****
Green/Cycle: 0.00 0.41  0.00 0.00 0.41  0.00 0.00 0.00  0.00 0.49 0.00  0.49
Volume/Cap:  0.00 0.37  0.00 0.00 0.54  0.00 0.00 0.00  0.00 0.54 0.00  0.51
Delay/Veh:    0.0 20.8   0.0  0.0 22.9   0.0  0.0  0.0   0.0 17.9  0.0  17.3
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 20.8   0.0  0.0 22.9   0.0  0.0  0.0   0.0 17.9  0.0  17.3
LOS by Move:    A    C     A    A    C     A    A    A     A    B    A     B
HCM2kAvgQ:      0    6     0    0   10     0    0    0     0    8    0     8
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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Rowland Heights Plaza
Existing
Weekday Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3

Cycle (sec):	100	Critical Vol./Cap.(X):	0.545
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	17.6
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Fullerton Road						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Protected			Split Phase			Split Phase	
Rights:		Include			Ignore			Ignore			Include	
Min. Green:	0	7	7	7	7	7	7	7	7	7	0	7
Lanes:		0 0 1 1 0			1 0 2 0 1			1 1 0 0 1			2 0 0 0 1	
Volume Module:												
Base Vol:	0	1278	15	12	684	217	410	10	552	5	0	18
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1278	15	12	684	217	410	10	552	5	0	18
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.00	0.98	0.98	0.00	0.98	0.98	0.98
PHF Volume:	0	1299	15	12	695	0	417	10	0	5	0	18
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1299	15	12	695	0	417	10	0	5	0	18
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	0	1299	15	12	695	0	417	10	0	5	0	18
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.92	1.00	0.85
Lanes:	0.00	1.98	0.02	1.00	2.00	1.00	1.95	0.05	1.00	2.00	0.00	1.00
Final Sat.:	0	3561	42	1805	3610	1900	3535	86	1900	3502	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.36	0.36	0.01	0.19	0.00	0.12	0.12	0.00	0.00	0.00	0.01
Crit Moves:		****		****			****			****		
Green/Cycle:	0.00	0.57	0.57	0.07	0.64	0.00	0.19	0.19	0.00	0.07	0.00	0.07
Volume/Cap:	0.00	0.63	0.63	0.10	0.30	0.00	0.64	0.64	0.00	0.02	0.00	0.16
Delay/Veh:	0.0	14.9	14.9	43.9	7.9	0.0	39.6	39.6	0.0	43.3	0.0	44.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	14.9	14.9	43.9	7.9	0.0	39.6	39.6	0.0	43.3	0.0	44.4
LOS by Move:	A	B	B	D	A	A	D	D	A	D	A	D
HCM2kAvgQ:	0	15	15	0	5	0	7	7	0	0	0	1

Note: Queue reported is the number of cars per lane.

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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                        Weekday Evening Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.524
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):        13.4
Optimal Cycle:        100               Level Of Service:                  B
********************************************************************************
Street Name:              Fullerton Road               SR-60 Freeway EB Ramps
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Permitted        Protected       Split Phase      Split Phase
Rights:          Include           Ignore          Ignore           Include
Min. Green:    0     7     7    7     7     7    7     7     7    7     0     7
Lanes:        0  0  1  1  0   1  0  2  0  1   1  1  0  0  1   2  0  0  0  1
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      0  1259    36   44   834   265  201    17   538   31     0    57
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  1259    36   44   834   265  201    17   538   31     0    57
Added Vol:     0     0     0    0     0     0    0     0     0    0     0     0
PasserByVol:   0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:   0  1259    36   44   834   265  201    17   538   31     0    57
User Adj:    1.00 1.00  1.00 1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96 0.96 0.96  0.00 0.96 0.96  0.00 0.96 0.96  0.96
PHF Volume:    0  1309    37   46   867     0  209    18     0   32     0    59
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   0  1309    37   46   867     0  209    18     0   32     0    59
PCE Adj:     1.00 1.00  1.00 1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  0.00 1.00 1.00  0.00 1.00 1.00  1.00
FinalVolume:   0  1309    37   46   867     0  209    18     0   32     0    59
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.95  0.95 0.95 0.95  1.00 0.96 0.96  1.00 0.92 1.00  0.85
Lanes:       0.00 1.94  0.06 1.00 2.00  1.00 1.84 0.16  1.00 2.00 0.00  1.00
Final Sat.:    0  3496   100 1805 3610  1900 3350  283  1900 3502    0  1615
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.37  0.37 0.03 0.24  0.00 0.06 0.06  0.00 0.01 0.00  0.04
Crit Moves:       ****       ****            ****             ****
Green/Cycle: 0.00 0.65  0.65 0.07 0.72  0.00 0.11 0.11  0.00 0.07 0.00  0.07
Volume/Cap:  0.00 0.57  0.57 0.36 0.33  0.00 0.57 0.57  0.00 0.13 0.00  0.52
Delay/Veh:    0.0 10.1  10.1 46.1  5.2   0.0 44.5 44.5   0.0 43.9  0.0  49.3
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 10.1  10.1 46.1  5.2   0.0 44.5 44.5   0.0 43.9  0.0  49.3
LOS by Move:   A    B     B    D    A     A    D    D     A    D    A     D
HCM2kAvgQ:     0   12    12    2    5     0    4    4     0    1    0     3
********************************************************************************
Note: Queue reported is the number of cars per lane.
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Rowland Heights Plaza
Existing
Saturday Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3

Cycle (sec):	100	Critical Vol./Cap.(X):	0.748
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	21.8
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Fullerton Road		SR-60 Freeway EB Ramps	
Approach:	North Bound	South Bound	East Bound	West Bound
Control:	Permitted	Protected	Split Phase	Split Phase
Rights:	Include	Ignore	Ignore	Include
Lanes:	0 0 1 1 0	1 0 2 0 1	1 1 0 0 1	2 0 0 0 1

Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	7	7	7	7	7	7	7	7	7	0	7
Volume Module:												
Base Vol:	0	1413	81	121	917	373	255	66	567	60	0	131
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1413	81	121	917	373	255	66	567	60	0	131
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.00	0.97	0.97	0.00	0.97	0.97	0.97
PHF Volume:	0	1457	84	125	945	0	263	68	0	62	0	135
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1457	84	125	945	0	263	68	0	62	0	135
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	0	1457	84	125	945	0	263	68	0	62	0	135
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.94	0.94	0.95	0.95	1.00	0.96	0.96	1.00	0.92	1.00	0.85
Lanes:	0.00	1.89	0.11	1.00	2.00	1.00	1.59	0.41	1.00	2.00	0.00	1.00
Final Sat.:	0	3387	194	1805	3610	1900	2904	752	1900	3502	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.43	0.43	0.07	0.26	0.00	0.09	0.09	0.00	0.02	0.00	0.08
Crit Moves:		****		****				****				****
Green/Cycle:	0.00	0.57	0.57	0.09	0.67	0.00	0.12	0.12	0.00	0.11	0.00	0.11
Volume/Cap:	0.00	0.75	0.75	0.75	0.39	0.00	0.75	0.75	0.00	0.16	0.00	0.75
Delay/Veh:	0.0	17.4	17.4	61.2	7.6	0.0	49.4	49.4	0.0	40.3	0.0	58.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	17.4	17.4	61.2	7.6	0.0	49.4	49.4	0.0	40.3	0.0	58.8
LOS by Move:	A	B	B	E	A	A	D	D	A	D	A	E
DesignQueue:	0	20	20	6	9	0	8	8	0	2	0	7

Note: Queue reported is the number of cars per lane.

Rowland Heights Plaza
Existing
Weekday Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16

Cycle (sec): 100 Critical Vol./Cap.(X): 0.729
Loss Time (sec): 10 (Y+R=0.0 sec) Average Delay (sec/veh): 25.3
Optimal Cycle: 100 Level Of Service: C

Street Name:	Nogales Street						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Ignore			Include			Include		
Min. Green:	0	7	7	0	7	7	0	0	0	7	0	7
Lanes:	0 0	3	0 1	0 0	3	0 1	0 0	0	0 0	0 0	1!	0 1
Volume Module:												
Base Vol:	0	1169	281	0	848	223	0	0	0	290	0	621
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1169	281	0	848	223	0	0	0	290	0	621
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.00	0.97	0.97	0.00	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	0	1211	0	0	879	0	0	0	0	301	0	644
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1211	0	0	879	0	0	0	0	301	0	644
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1211	0	0	879	0	0	0	0	301	0	644
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.80	1.00	0.76
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	0.00	0.00	0.00	0.47	0.00	1.53
Final Sat.:	0	5187	1900	0	5187	1900	0	0	0	712	0	2200
Capacity Analysis Module:												
Vol/Sat:	0.00	0.23	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.42	0.00	0.29
Crit Moves:		****								****		
Green/Cycle:	0.00	0.32	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.58	0.00	0.58
Volume/Cap:	0.00	0.73	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.73	0.00	0.50
Delay/Veh:	0.0	31.8	0.0	0.0	28.1	0.0	0.0	0.0	0.0	17.4	0.0	12.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	31.8	0.0	0.0	28.1	0.0	0.0	0.0	0.0	17.4	0.0	12.7
LOS by Move:	A	C	A	A	C	A	A	A	A	B	A	B
HCM2kAvgQ:	0	13	0	0	8	0	0	0	0	15	0	8

Note: Queue reported is the number of cars per lane.

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--------------------------------------------------------------------------------
                         Rowland Heights Plaza
                               Existing
                      Weekday Evening Peak Hour
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):        0.709
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):       25.4
Optimal Cycle:        100               Level Of Service:                 C
********************************************************************************
Street Name:               Nogales Street              SR-60 Freeway WB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:            Ignore           Ignore          Include          Include
Min. Green:    0     7     7   0     7     7   0     0     0   7     0     7
Lanes:         0  0  3  0  1   0  0  3  0  1   0  0  0  0  0   0  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        0 1019  216     0 1226  454     0    0    0   383    0  262
Growth Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:     0 1019  216     0 1226  454     0    0    0   383    0  262
User Adj:     1.00 1.00 0.00  1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:      0.93 0.93 0.00  0.93 0.93 0.00  0.93 0.93 0.93  0.93 0.93 0.93
PHF Volume:      0 1092    0     0 1314    0     0    0    0   411    0  281
Reduct Vol:      0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:     0 1092    0     0 1314    0     0    0    0   411    0  281
PCE Adj:      1.00 1.00 0.00  1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:      1.00 1.00 0.00  1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:     0 1092    0     0 1314    0     0    0    0   411    0  281
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:   1.00 0.91 1.00  1.00 0.91 1.00  1.00 1.00 1.00  0.76 1.00 0.73
Lanes:        0.00 3.00 1.00  0.00 3.00 1.00  0.00 0.00 0.00  0.74 0.00 1.26
Final Sat.:      0 5187 1900     0 5187 1900     0    0    0  1066    0 1758
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.00 0.21 0.00  0.00 0.25 0.00  0.00 0.00 0.00  0.39 0.00 0.16
Crit Moves:                        ****                          ****
Green/Cycle:  0.00 0.36 0.00  0.00 0.36 0.00  0.00 0.00 0.00  0.54 0.00 0.54
Volume/Cap:   0.00 0.59 0.00  0.00 0.71 0.00  0.00 0.00 0.00  0.71 0.00 0.29
Delay/Veh:     0.0 26.7  0.0   0.0 29.0  0.0   0.0  0.0  0.0  19.4  0.0 12.5
User DelAdj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:    0.0 26.7  0.0   0.0 29.0  0.0   0.0  0.0  0.0  19.4  0.0 12.5
LOS by Move:     A    C    A     A    C    A     A    A    A     B    A    B
HCM2kAvgQ:       0   10    0     0   14    0     0    0    0    14    0    4
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                           Rowland Heights Plaza
                                 Existing
                            Saturday Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.772
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):        28.0
Optimal Cycle:       100              Level Of Service:                  C
********************************************************************************
Street Name:              Nogales Street                SR-60 Freeway WB Ramps
Approach:        North Bound      South Bound       East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted         Permitted         Permitted
Rights:            Ignore           Ignore           Include           Include
Min. Green:    0     7     7    0     7     7    0     0     0    7     0     7
Lanes:         0  0  3  0  1    0  0  3  0  1    0  0  0  0  0    0  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0   991   364    0  1125   401    0     0     0   435    0   418
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   0   991   364    0  1125   401    0     0     0   435    0   418
User Adj:    1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.95  0.95  0.00 0.95  0.95  0.00 0.95  0.95  0.95 0.95  0.95  0.95
PHF Volume:    0  1039     0    0  1179     0    0     0     0   456    0   438
Reduct Vol:    0     0     0    0     0     0    0     0     0     0    0     0
Reduced Vol:   0  1039     0    0  1179     0    0     0     0   456    0   438
PCE Adj:     1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:   0  1039     0    0  1179     0    0     0     0   456    0   438
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900  1900
Adjustment:  1.00  0.91  1.00 1.00  0.91  1.00 1.00  1.00  1.00 0.77  1.00  0.74
Lanes:       0.00  3.00  1.00 0.00  3.00  1.00 0.00  0.00  0.00 0.67  0.00  1.33
Final Sat.:    0  5187  1900    0  5187  1900    0     0     0   975    0  1872
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.20  0.00 0.00  0.23  0.00 0.00  0.00  0.00 0.47  0.00  0.23
Crit Moves:                         ****                         ****
Green/Cycle: 0.00  0.29  0.00 0.00  0.29  0.00 0.00  0.00  0.00 0.61  0.00  0.61
Volume/Cap:  0.00  0.68  0.00 0.00  0.77  0.00 0.00  0.00  0.00 0.77  0.00  0.39
Delay/Veh:    0.0  32.4   0.0  0.0  34.7   0.0  0.0   0.0   0.0 17.9   0.0  10.3
User DelAdj: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
AdjDel/Veh:   0.0  32.4   0.0  0.0  34.7   0.0  0.0   0.0   0.0 17.9   0.0  10.3
LOS by Move:   A     C     A    A     C     A    A     A     A    B     A     B
HCM2kAvgQ:     0    11     0    0    14     0    0     0     0   17     0     5
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                                Existing
                        Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.613
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):        23.8
Optimal Cycle:        100              Level Of Service:                 C
********************************************************************************
Street Name:              Nogales Street              SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|-----------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:            Ignore           Ignore          Include          Include
Min. Green:     0     7     7    0     7     7    7     0     7    0     0     0
Lanes:          0  0  3  0  1    0  0  3  0  1    1  0  1! 0  0    0  0  0  0  0
------------|-----------------||---------------||---------------||---------------|
Volume Module:
Base Vol:         0 1049   387     0  926   212   401    0   243     0    0     0
Growth Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:      0 1049   387     0  926   212   401    0   243     0    0     0
User Adj:      1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:       0.94 0.94  0.00  0.94 0.94  0.00  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:       0 1122     0     0  990     0   429    0   260     0    0     0
Reduct Vol:       0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:      0 1122     0     0  990     0   429    0   260     0    0     0
PCE Adj:       1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:       1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:      0 1122     0     0  990     0   429    0   260     0    0     0
------------|-----------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:      1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:    1.00 0.91  1.00  1.00 0.91  1.00  0.73 1.00  0.76  1.00 1.00  1.00
Lanes:         0.00 3.00  1.00  0.00 3.00  1.00  1.46 0.00  0.54  0.00 0.00  0.00
Final Sat.:       0 5187  1900     0 5187  1900  2028    0   775     0    0     0
------------|-----------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:       0.00 0.22  0.00  0.00 0.19  0.00  0.21 0.00  0.34  0.00 0.00  0.00
Crit Moves:         ****                                     ****
Green/Cycle:   0.00 0.35  0.00  0.00 0.35  0.00  0.55 0.00  0.55  0.00 0.00  0.00
Volume/Cap:    0.00 0.61  0.00  0.00 0.54  0.00  0.39 0.00  0.61  0.00 0.00  0.00
Delay/Veh:      0.0 27.3   0.0   0.0 26.2   0.0  13.1  0.0  16.4   0.0  0.0   0.0
User DelAdj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:     0.0 27.3   0.0   0.0 26.2   0.0  13.1  0.0  16.4   0.0  0.0   0.0
LOS by Move:      A    C     A     A    C     A     B    A     B     A    A     A
HCM2kAvgQ:        0   11     0     0    9     0     5    0    11     0    0     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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Rowland Heights Plaza
Existing
Weekday Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17

Cycle (sec):	100	Critical Vol./Cap.(X):	0.823
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	27.5
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Ignore			Include			Include		
Min. Green:	0	7	7	0	7	7	7	0	7	0	0	0
Lanes:	0 0	3	0 1	0 0	3	0 1	1 0	1!	0 0	0 0	0	0 0
Volume Module:												
Base Vol:	0	840	288	0	1322	287	397	0	420	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	840	288	0	1322	287	397	0	420	0	0	0
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.00	0.92	0.92	0.00	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	0	912	0	0	1435	0	431	0	456	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	912	0	0	1435	0	431	0	456	0	0	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	912	0	0	1435	0	431	0	456	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	0.74	1.00	0.77	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	1.33	0.00	0.67	0.00	0.00	0.00
Final Sat.:	0	5187	1900	0	5187	1900	1871	0	982	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.18	0.00	0.00	0.28	0.00	0.23	0.00	0.46	0.00	0.00	0.00
Crit Moves:					****				****			
Green/Cycle:	0.00	0.34	0.00	0.00	0.34	0.00	0.56	0.00	0.56	0.00	0.00	0.00
Volume/Cap:	0.00	0.52	0.00	0.00	0.82	0.00	0.41	0.00	0.82	0.00	0.00	0.00
Delay/Veh:	0.0	27.0	0.0	0.0	33.8	0.0	12.5	0.0	23.0	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	27.0	0.0	0.0	33.8	0.0	12.5	0.0	23.0	0.0	0.0	0.0
LOS by Move:	A	C	A	A	C	A	B	A	C	A	A	A
HCM2kAvgQ:	0	9	0	0	17	0	6	0	19	0	0	0

Note: Queue reported is the number of cars per lane.

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--------------------------------------------------------------------------------
                           Rowland Heights Plaza
                                 Existing
                            Saturday Peak Hour
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):          0.704
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):         25.6
Optimal Cycle:        100               Level Of Service:                   C
********************************************************************************
Street Name:                Nogales Street              SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Ignore           Ignore          Include          Include
Min. Green:   0     7     7    0     7     7    7     0     7    0     0     0
Lanes:        0  0  3  0  1    0  0  3  0  1    1  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  947   423     0 1160   370   415     0   352     0     0     0
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  947   423     0 1160   370   415     0   352     0     0     0
User Adj:   1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    0.97 0.97  0.00  0.97 0.97  0.00  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:    0  976     0     0 1196     0   428     0   363     0     0     0
Reduct Vol:    0    0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:   0  976     0     0 1196     0   428     0   363     0     0     0
PCE Adj:    1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   0  976     0     0 1196     0   428     0   363     0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment: 1.00 0.91  1.00  1.00 0.91  1.00  0.74 1.00  0.77  1.00 1.00  1.00
Lanes:      0.00 3.00  1.00  0.00 3.00  1.00  1.38 0.00  0.62  0.00 0.00  0.00
Final Sat.:    0 5187  1900     0 5187  1900  1929    0   901     0     0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00 0.19  0.00  0.00 0.23  0.00  0.22 0.00  0.40  0.00 0.00  0.00
Crit Moves:                       ****                    ****
Green/Cycle: 0.00 0.33  0.00  0.00 0.33  0.00  0.57 0.00  0.57  0.00 0.00  0.00
Volume/Cap: 0.00 0.57  0.00  0.00 0.70  0.00  0.39 0.00  0.70  0.00 0.00  0.00
Delay/Veh:   0.0 28.3   0.0   0.0 30.7   0.0  11.9  0.0  17.4   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  0.0 28.3   0.0   0.0 30.7   0.0  11.9  0.0  17.4   0.0  0.0   0.0
LOS by Move:   A    C     A     A    C     A     B    A     B     A    A     A
HCM2kAvgQ:     0   10     0     0   13     0     5    0    14     0    0     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

Existing Plus Project

```
---------------------------------------------------------------------------
                        Rowland Heights Plaza
                        Existing Plus Project
                      Weekday Morning Peak Hour
---------------------------------------------------------------------------

                 Level Of Service Computation Report
         2000 HCM Operations Method (Future Volume Alternative)
***************************************************************************
Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2
***************************************************************************
Cycle (sec):        100               Critical Vol./Cap.(X):        0.553
Loss Time (sec):     10 (Y+R=0.0 sec) Average Delay (sec/veh):       20.3
Optimal Cycle:      100               Level Of Service:                 C
***************************************************************************
Street Name:            Fullerton Road              SR-60 Freeway WB Ramps
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Ignore           Include          Include          Include
Min. Green:    0     7     7    0     7     0    0     0     0    7     0     7
Lanes:        0  0  3  0  1   0  0  3  0  0   0  0  0  0  0   1  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1004   323     0  604     0     0    0     0   391    0   573
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1004   323     0  604     0     0    0     0   391    0   573
Added Vol:     0  109     0     0   80     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0 1113   323     0  684     0     0    0     0   391    0   573
User Adj:    1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.00  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:    0 1185     0     0  728     0     0    0     0   416    0   610
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0 1185     0     0  728     0     0    0     0   416    0   610
PCE Adj:     1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   0 1185     0     0  728     0     0    0     0   416    0   610
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.91  1.00  1.00 0.91  1.00  1.00 1.00  1.00  0.75 1.00  0.75
Lanes:       0.00 3.00  1.00  0.00 3.00  0.00  0.00 0.00  0.00  1.41 0.00  1.59
Final Sat.:    0 5187  1900     0 5187     0     0    0     0  2000    0  2269
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.23  0.00  0.00 0.14  0.00  0.00 0.00  0.00  0.21 0.00  0.27
Crit Moves:       ****                                                     ****
Green/Cycle: 0.00 0.41  0.00  0.00 0.41  0.00  0.00 0.00  0.00  0.49 0.00  0.49
Volume/Cap:  0.00 0.55  0.00  0.00 0.34  0.00  0.00 0.00  0.00  0.43 0.00  0.55
Delay/Veh:    0.0 22.6   0.0   0.0 20.1   0.0   0.0  0.0   0.0  16.8  0.0  18.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 22.6   0.0   0.0 20.1   0.0   0.0  0.0   0.0  16.8  0.0  18.4
LOS by Move:   A    C     A     A    C     A     A    A     A     B    A     B
HCM2kAvgQ:     0   10     0     0    6     0     0    0     0     6    0     9
***************************************************************************
Note: Queue reported is the number of cars per lane.
```

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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                          Existing Plus Project
                        Weekday Evening Peak Hour
--------------------------------------------------------------------------------

                   Level Of Service Computation Report
        2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.452
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):       17.0
Optimal Cycle:        100              Level Of Service:                 B
********************************************************************************
Street Name:              Fullerton Road               SR-60 Freeway WB Ramps
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Ignore          Include          Include          Include
Min. Green:    0     7     7   0     7     0   0     0     0   7     0     7
Lanes:        0  0  3  0  1   0  0  3  0  0   0  0  0  0  0   1  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0   709   532     0  1049     0     0     0     0   368     0   334
Growth Adj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   0   709   532     0  1049     0     0     0     0   368     0   334
Added Vol:     0   148     0     0   133     0     0     0     0     0     0     0
PasserByVol:   0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   0   857   532     0  1182     0     0     0     0   368     0   334
User Adj:   1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:    0.98  0.98  0.00  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98
PHF Volume:    0   872     0     0  1202     0     0     0     0   374     0   340
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   0   872     0     0  1202     0     0     0     0   374     0   340
PCE Adj:    1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:    1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:   0   872     0     0  1202     0     0     0     0   374     0   340
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment: 1.00  0.91  1.00  1.00  0.91  1.00  1.00  1.00  1.00  0.74  1.00  0.74
Lanes:      0.00  3.00  1.00  0.00  3.00  0.00  0.00  0.00  0.00  1.52  0.00  1.48
Final Sat.:    0  5187  1900     0  5187     0     0     0     0  2144     0  2076
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00  0.17  0.00  0.00  0.23  0.00  0.00  0.00  0.00  0.17  0.00  0.16
Crit Moves:                         ****                          ****
Green/Cycle: 0.00 0.51  0.00  0.00  0.51  0.00  0.00  0.00  0.00  0.39  0.00  0.39
Volume/Cap: 0.00  0.33  0.00  0.00  0.45  0.00  0.00  0.00  0.00  0.45  0.00  0.42
Delay/Veh:   0.0  14.3   0.0   0.0  15.5   0.0   0.0   0.0   0.0  23.0   0.0  22.7
User DelAdj: 1.00 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:  0.0  14.3   0.0   0.0  15.5   0.0   0.0   0.0   0.0  23.0   0.0  22.7
LOS by Move:   A     B     A     A     B     A     A     A     A     C     A     C
HCM2kAvgQ:     0     6     0     0     9     0     0     0     0     6     0     5
********************************************************************************
Note: Queue reported is the number of cars per lane.
```

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Rowland Heights Plaza
Existing Plus Project
Saturday Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2

Cycle (sec):	100	Critical Vol./Cap.(X):	0.583
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	20.4
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Fullerton Road		SR-60 Freeway WB Ramps	
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Permitted	Permitted	Permitted	Permitted
Rights:	Ignore	Include	Include	Include
Min. Green:	0 7 7	0 7 0	0 0 0	7 0 7
Lanes:	0 0 3 0 1	0 0 3 0 0	0 0 0 0 0	1 0 1! 0 1

	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Volume Module:												
Base Vol:	0	744	579	0	1097	0	0	0	0	549	0	494
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	744	579	0	1097	0	0	0	0	549	0	494
Added Vol:	0	187	0	0	174	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	931	579	0	1271	0	0	0	0	549	0	494
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.00	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	0	974	0	0	1329	0	0	0	0	574	0	517
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	974	0	0	1329	0	0	0	0	574	0	517
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	974	0	0	1329	0	0	0	0	574	0	517
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.74	1.00	0.74
Lanes:	0.00	3.00	1.00	0.00	3.00	0.00	0.00	0.00	0.00	1.53	0.00	1.47
Final Sat.:	0	5187	1900	0	5187	0	0	0	0	2142	0	2068
Capacity Analysis Module:												
Vol/Sat:	0.00	0.19	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.27	0.00	0.25
Crit Moves:					****					****		
Green/Cycle:	0.00	0.44	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.46	0.00	0.46
Volume/Cap:	0.00	0.43	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.58	0.00	0.54
Delay/Veh:	0.0	19.4	0.0	0.0	21.5	0.0	0.0	0.0	0.0	20.4	0.0	19.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	19.4	0.0	0.0	21.5	0.0	0.0	0.0	0.0	20.4	0.0	19.7
LOS by Move:	A	B	A	A	C	A	A	A	A	C	A	B
HCM2kAvgQ:	0	8	0	0	12	0	0	0	0	9	0	8

Note: Queue reported is the number of cars per lane.

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Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3

Cycle (sec):	100	Critical Vol./Cap.(X):	0.579
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	18.9
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Fullerton Road						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Ignore			Include		
Min. Green:	0	7	7	7	7	7	7	7	7	7	0	7
Lanes:	0 0	1 1	0	1 0	2 0	1	1 1	0 0	1	2 0	0 0	1
Volume Module:												
Base Vol:	0	1278	15	12	684	217	410	10	552	5	0	18
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1278	15	12	684	217	410	10	552	5	0	18
Added Vol:	0	50	0	0	37	0	59	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1328	15	12	721	217	469	10	552	5	0	18
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.00	0.98	0.98	0.00	0.98	0.98	0.98
PHF Volume:	0	1350	15	12	733	0	477	10	0	5	0	18
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1350	15	12	733	0	477	10	0	5	0	18
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	0	1350	15	12	733	0	477	10	0	5	0	18
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.92	1.00	0.85
Lanes:	0.00	1.98	0.02	1.00	2.00	1.00	1.96	0.04	1.00	2.00	0.00	1.00
Final Sat.:	0	3563	40	1805	3610	1900	3546	76	1900	3502	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.38	0.38	0.01	0.20	0.00	0.13	0.13	0.00	0.00	0.00	0.01
Crit Moves:		****		****			****			****		
Green/Cycle:	0.00	0.56	0.56	0.07	0.63	0.00	0.20	0.20	0.00	0.07	0.00	0.07
Volume/Cap:	0.00	0.68	0.68	0.10	0.32	0.00	0.68	0.68	0.00	0.02	0.00	0.16
Delay/Veh:	0.0	16.4	16.4	43.9	8.6	0.0	39.6	39.6	0.0	43.3	0.0	44.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	16.4	16.4	43.9	8.6	0.0	39.6	39.6	0.0	43.3	0.0	44.4
LOS by Move:	A	B	B	D	A	A	D	D	A	D	A	D
HCM2kAvgQ:	0	16	16	0	5	0	8	8	0	0	0	1

Note: Queue reported is the number of cars per lane.

```
--------------------------------------------------------------------------------
                           Rowland Heights Plaza
                           Existing Plus Project
                         Weekday Evening Peak Hour
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):          0.571
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):        15.4
Optimal Cycle:        100              Level Of Service:                  B
********************************************************************************
Street Name:            Fullerton Road              SR-60 Freeway EB Ramps
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:          Permitted        Protected       Split Phase      Split Phase
Rights:            Include          Ignore           Ignore           Include
Min. Green:     0     7     7    7     7     7    7     7     7    7     0     7
Lanes:          0  0  1  1  0   1  0  2  0  1   1  1  0  0  1   2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1259     36    44  834   265   201   17   538    31    0    57
Growth Adj:  1.00 1.00   1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1259     36    44  834   265   201   17   538    31    0    57
Added Vol:      0   70      0     0   62     0    78    0     0     0    0     0
PasserByVol:    0    0      0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 1329     36    44  896   265   279   17   538    31    0    57
User Adj:    1.00 1.00   1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96   0.96  0.96 0.96  0.00  0.96 0.96  0.00  0.96 0.96  0.96
PHF Volume:     0 1381     37    46  931     0   290   18     0    32    0    59
Reduct Vol:     0    0      0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1381     37    46  931     0   290   18     0    32    0    59
PCE Adj:     1.00 1.00   1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00   1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
FinalVolume:    0 1381     37    46  931     0   290   18     0    32    0    59
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900   1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.95   0.95  0.95 0.95  1.00  0.96 0.96  1.00  0.92 1.00  0.85
Lanes:       0.00 1.95   0.05  1.00 2.00  1.00  1.89 0.11  1.00  2.00 0.00  1.00
Final Sat.:     0 3501     95  1805 3610  1900  3421  208  1900  3502    0  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.39   0.39  0.03 0.26  0.00  0.08 0.08  0.00  0.01 0.00  0.04
Crit Moves:       ****         ****                   ****         ****
Green/Cycle: 0.00 0.63   0.63  0.07 0.70  0.00  0.13 0.13  0.00  0.07 0.00  0.07
Volume/Cap:  0.00 0.63   0.63  0.36 0.37  0.00  0.63 0.63  0.00  0.13 0.00  0.52
Delay/Veh:    0.0 12.2   12.2  46.1  6.3   0.0  43.6 43.6   0.0  43.9  0.0  49.3
User DelAdj: 1.00 1.00   1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 12.2   12.2  46.1  6.3   0.0  43.6 43.6   0.0  43.9  0.0  49.3
LOS by Move:    A    B      B     D    A     A     D    D     A     D    A     D
HCM2kAvgQ:      0   14     14     2    6     0     6    6     0     1    0     3
********************************************************************************
Note: Queue reported is the number of cars per lane.
```

Rowland Heights Plaza
Existing Plus Project
Saturday Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3

Cycle (sec):	100	Critical Vol./Cap.(X):	0.808
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	24.6
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Fullerton Road						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Ignore			Include		
Min. Green:	0	7	7	7	7	7	7	7	7	7	0	7
Lanes:	0 0	1 1	0	1 0	2 0	1	1 1	0 0	1	2 0	0 0	1
Volume Module:												
Base Vol:	0	1413	81	121	917	373	255	66	567	60	0	131
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1413	81	121	917	373	255	66	567	60	0	131
Added Vol:	0	88	0	0	82	0	99	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1501	81	121	999	373	354	66	567	60	0	131
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.00	0.97	0.97	0.00	0.97	0.97	0.97
PHF Volume:	0	1547	84	125	1030	0	365	68	0	62	0	135
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1547	84	125	1030	0	365	68	0	62	0	135
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	0	1547	84	125	1030	0	365	68	0	62	0	135
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.94	0.94	0.95	0.95	1.00	0.96	0.96	1.00	0.92	1.00	0.85
Lanes:	0.00	1.90	0.10	1.00	2.00	1.00	1.69	0.31	1.00	2.00	0.00	1.00
Final Sat.:	0	3398	183	1805	3610	1900	3075	573	1900	3502	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.46	0.46	0.07	0.29	0.00	0.12	0.12	0.00	0.02	0.00	0.08
Crit Moves:		****		****			****					****
Green/Cycle:	0.00	0.56	0.56	0.09	0.65	0.00	0.15	0.15	0.00	0.10	0.00	0.10
Volume/Cap:	0.00	0.81	0.81	0.81	0.44	0.00	0.81	0.81	0.00	0.17	0.00	0.81
Delay/Veh:	0.0	20.0	20.0	70.9	8.7	0.0	50.1	50.1	0.0	41.1	0.0	68.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	20.0	20.0	70.9	8.7	0.0	50.1	50.1	0.0	41.1	0.0	68.3
LOS by Move:	A	B	B	E	A	A	D	D	A	D	A	E
HCM2kAvgQ:	0	23	23	6	8	0	9	9	0	1	0	6

Note: Queue reported is the number of cars per lane.

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----------------------------------------------------------------------------
                           Rowland Heights Plaza
                           Existing Plus Project
                 Weekday Morning Peak Hour - With Improvements
----------------------------------------------------------------------------

                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
****************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
****************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.451
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):       18.7
Optimal Cycle:        100                Level Of Service:                 B
****************************************************************************
Street Name:              Fullerton Road                SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Protected       Split Phase      Split Phase
Rights:          Include           Ignore           Ignore          Include
Min. Green:    0    7     7    7    7     7    7    7     7    7    0     7
Lanes:        0  0  2  1  0   1  0  2  0  1   1  1  0  0  1   2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1278    15    12  684   217   410   10   552     5    0    18
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1278    15    12  684   217   410   10   552     5    0    18
Added Vol:     0   50     0     0   37     0    59    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0 1328    15    12  721   217   469   10   552     5    0    18
User Adj:    1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
PHF Adj:     0.98 0.98  0.98  0.98 0.98  0.00  0.98 0.98  0.00  0.98 0.98  0.98
PHF Volume:    0 1350    15    12  733     0   477   10     0     5    0    18
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0 1350    15    12  733     0   477   10     0     5    0    18
PCE Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
FinalVolume:   0 1350    15    12  733     0   477   10     0     5    0    18
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.91  0.91  0.95 0.95  1.00  0.95 0.95  1.00  0.92 1.00  0.85
Lanes:       0.00 2.97  0.03  1.00 2.00  1.00  1.96 0.04  1.00  2.00 0.00  1.00
Final Sat.:    0 5119    58  1805 3610  1900  3546   76  1900  3502    0  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.26  0.26  0.01 0.20  0.00  0.13 0.13  0.00  0.00 0.00  0.01
Crit Moves:       ****        ****             ****             ****
Green/Cycle: 0.00 0.50  0.50  0.07 0.57  0.00  0.26 0.26  0.00  0.07 0.00  0.07
Volume/Cap:  0.00 0.52  0.52  0.10 0.35  0.00  0.52 0.52  0.00  0.02 0.00  0.16
Delay/Veh:    0.0 16.9  16.9  43.9 11.5   0.0  32.5 32.5   0.0  43.3  0.0  44.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 16.9  16.9  43.9 11.5   0.0  32.5 32.5   0.0  43.3  0.0  44.4
LOS by Move:    A    B     B     D    B     A     C    C     A     D    A     D
HCM2kAvgQ:      0   10    10     0    6     0     7    7     0     0    0     1
****************************************************************************
Note: Queue reported is the number of cars per lane.
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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                          Existing Plus Project
               Weekday Evening Peak Hour - With Improvements
--------------------------------------------------------------------------------

                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.438
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):        15.8
Optimal Cycle:        100               Level Of Service:                  B
********************************************************************************
Street Name:              Fullerton Road               SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Protected       Split Phase      Split Phase
Rights:          Include           Ignore           Ignore          Include
Min. Green:    0     7     7    7     7     7    7     7     7    7     0     7
Lanes:        0  0  2  1  0   1  0  2  0  1   1  1  0  0  1   2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  1259    36    44   834   265   201    17   538    31     0    57
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  1259    36    44   834   265   201    17   538    31     0    57
Added Vol:     0    70     0     0    62     0    78     0     0     0     0     0
PasserByVol:   0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   0  1329    36    44   896   265   279    17   538    31     0    57
User Adj:    1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.00  0.96 0.96  0.00  0.96 0.96  0.96
PHF Volume:    0  1381    37    46   931     0   290    18     0    32     0    59
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   0  1381    37    46   931     0   290    18     0    32     0    59
PCE Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
FinalVolume:   0  1381    37    46   931     0   290    18     0    32     0    59
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.91  0.91  0.95 0.95  1.00  0.96 0.96  1.00  0.92 1.00  0.85
Lanes:       0.00 2.92  0.08  1.00 2.00  1.00  1.89 0.11  1.00  2.00 0.00  1.00
Final Sat.:    0  5030   136  1805 3610  1900  3421  208  1900  3502     0  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.27  0.27  0.03 0.26  0.00  0.08 0.08  0.00  0.01 0.00  0.04
Crit Moves:       ****        ****                   ****        ****
Green/Cycle: 0.00 0.57  0.57  0.07 0.64  0.00  0.18 0.18  0.00  0.08 0.00  0.08
Volume/Cap:  0.00 0.48  0.48  0.36 0.40  0.00  0.48 0.48  0.00  0.11 0.00  0.44
Delay/Veh:    0.0 12.9  12.9  46.1  8.8   0.0  37.7 37.7   0.0  42.5  0.0  45.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 12.9  12.9  46.1  8.8   0.0  37.7 37.7   0.0  42.5  0.0  45.8
LOS by Move:    A    B     B     D    A     A     D    D     A     D    A     D
HCM2kAvgQ:      0    9     9     2    7     0     5    5     0     1    0     2
********************************************************************************
Note: Queue reported is the number of cars per lane.
```

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Rowland Heights Plaza
Existing Plus Project
Saturday Peak Hour - With Improvements

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3

Cycle (sec):	100	Critical Vol./Cap.(X):	0.654
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	22.8
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Fullerton Road						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Ignore			Include		
Min. Green:	0	7	7	7	7	7	7	7	7	7	0	7
Lanes:	0 0 2 1 0			1 0 2 0 1			1 1 0 0 1			2 0 0 0 1		
Volume Module:												
Base Vol:	0	1413	81	121	917	373	255	66	567	60	0	131
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1413	81	121	917	373	255	66	567	60	0	131
Added Vol:	0	88	0	0	82	0	99	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1501	81	121	999	373	354	66	567	60	0	131
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.00	0.97	0.97	0.00	0.97	0.97	0.97
PHF Volume:	0	1547	84	125	1030	0	365	68	0	62	0	135
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1547	84	125	1030	0	365	68	0	62	0	135
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	0	1547	84	125	1030	0	365	68	0	62	0	135
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.90	0.90	0.95	0.95	1.00	0.96	0.96	1.00	0.92	1.00	0.85
Lanes:	0.00	2.85	0.15	1.00	2.00	1.00	1.69	0.31	1.00	2.00	0.00	1.00
Final Sat.:	0	4882	263	1805	3610	1900	3075	573	1900	3502	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.32	0.32	0.07	0.29	0.00	0.12	0.12	0.00	0.02	0.00	0.08
Crit Moves:		****		****			****					****
Green/Cycle:	0.00	0.48	0.48	0.11	0.59	0.00	0.18	0.18	0.00	0.13	0.00	0.13
Volume/Cap:	0.00	0.65	0.65	0.65	0.48	0.00	0.65	0.65	0.00	0.14	0.00	0.65
Delay/Veh:	0.0	20.1	20.1	50.9	11.9	0.0	40.4	40.4	0.0	38.9	0.0	48.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	20.1	20.1	50.9	11.9	0.0	40.4	40.4	0.0	38.9	0.0	48.8
LOS by Move:	A	C	C	D	B	A	D	D	A	D	A	D
HCM2kAvgQ:	0	14	14	5	10	0	7	7	0	1	0	5

Note: Queue reported is the number of cars per lane.

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Rowland Heights Plaza
Existing Plus Project
Weekday Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16

Cycle (sec):	100	Critical Vol./Cap.(X):	0.764
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	26.0
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Ignore			Include			Include		
Min. Green:	0	7	7	0	7	7	0	0	0	7	0	7
Lanes:	0 0 3 0 1			0 0 3 0 1			0 0 0 0 0			0 0 1! 0 1		
Volume Module:												
Base Vol:	0	1169	281	0	848	223	0	0	0	290	0	621
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1169	281	0	848	223	0	0	0	290	0	621
Added Vol:	0	57	0	0	85	0	0	0	0	0	0	59
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1226	281	0	933	223	0	0	0	290	0	680
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.00	0.97	0.97	0.00	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	0	1270	0	0	967	0	0	0	0	301	0	705
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1270	0	0	967	0	0	0	0	301	0	705
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1270	0	0	967	0	0	0	0	301	0	705
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.80	1.00	0.76
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	0.00	0.00	0.00	0.45	0.00	1.55
Final Sat.:	0	5187	1900	0	5187	1900	0	0	0	680	0	2239
Capacity Analysis Module:												
Vol/Sat:	0.00	0.24	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.44	0.00	0.31
Crit Moves:		****								****		
Green/Cycle:	0.00	0.32	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.58	0.00	0.58
Volume/Cap:	0.00	0.76	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.76	0.00	0.54
Delay/Veh:	0.0	32.7	0.0	0.0	28.9	0.0	0.0	0.0	0.0	18.6	0.0	13.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	32.7	0.0	0.0	28.9	0.0	0.0	0.0	0.0	18.6	0.0	13.3
LOS by Move:	A	C	A	A	C	A	A	A	A	B	A	B
HCM2kAvgQ:	0	14	0	0	10	0	0	0	0	17	0	9

Note: Queue reported is the number of cars per lane.

Rowland Heights Plaza
Existing Plus Project
Weekday Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16

Cycle (sec):	100	Critical Vol./Cap.(X):	0.772
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	26.2
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Ignore			Include			Include		
Min. Green:	0	7	7	0	7	7	0	0	0	7	0	7
Lanes:	0 0 3 0 1			0 0 3 0 1			0 0 0 0 0			0 0 1! 0 1		
Volume Module:												
Base Vol:	0	1019	216	0	1226	454	0	0	0	383	0	262
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1019	216	0	1226	454	0	0	0	383	0	262
Added Vol:	0	85	0	0	145	0	0	0	0	0	0	78
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1104	216	0	1371	454	0	0	0	383	0	340
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.00	0.93	0.93	0.00	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	1183	0	0	1469	0	0	0	0	411	0	364
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1183	0	0	1469	0	0	0	0	411	0	364
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1183	0	0	1469	0	0	0	0	411	0	364
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.77	1.00	0.74
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	0.00	0.00	0.00	0.68	0.00	1.32
Final Sat.:	0	5187	1900	0	5187	1900	0	0	0	997	0	1844
Capacity Analysis Module:												
Vol/Sat:	0.00	0.23	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.41	0.00	0.20
Crit Moves:					****					****		
Green/Cycle:	0.00	0.37	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.53	0.00	0.53
Volume/Cap:	0.00	0.62	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.77	0.00	0.37
Delay/Veh:	0.0	26.6	0.0	0.0	30.0	0.0	0.0	0.0	0.0	22.3	0.0	13.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	26.6	0.0	0.0	30.0	0.0	0.0	0.0	0.0	22.3	0.0	13.7
LOS by Move:	A	C	A	A	C	A	A	A	A	C	A	B
HCM2kAvgQ:	0	11	0	0	16	0	0	0	0	16	0	5

Note: Queue reported is the number of cars per lane.

Rowland Heights Plaza
Existing Plus Project
Saturday Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16

Cycle (sec):	100	Critical Vol./Cap.(X):	0.852
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	29.6
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Ignore			Include			Include		
Min. Green:	0	7	7	0	7	7	0	0	0	7	0	7
Lanes:	0 0	3	0 1	0 0	3	0 1	0 0	0	0 0	0 0	1!	0 1
Volume Module:												
Base Vol:	0	991	364	0	1125	401	0	0	0	435	0	418
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	991	364	0	1125	401	0	0	0	435	0	418
Added Vol:	0	107	0	0	191	0	0	0	0	0	0	99
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1098	364	0	1316	401	0	0	0	435	0	517
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.00	0.95	0.95	0.00	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	1151	0	0	1379	0	0	0	0	456	0	542
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1151	0	0	1379	0	0	0	0	456	0	542
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1151	0	0	1379	0	0	0	0	456	0	542
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.78	1.00	0.74
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	0.00	0.00	0.00	0.62	0.00	1.38
Final Sat.:	0	5187	1900	0	5187	1900	0	0	0	910	0	1952
Capacity Analysis Module:												
Vol/Sat:	0.00	0.22	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.50	0.00	0.28
Crit Moves:					****					****		
Green/Cycle:	0.00	0.31	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.59	0.00	0.59
Volume/Cap:	0.00	0.71	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.85	0.00	0.47
Delay/Veh:	0.0	31.9	0.0	0.0	36.8	0.0	0.0	0.0	0.0	23.2	0.0	11.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	31.9	0.0	0.0	36.8	0.0	0.0	0.0	0.0	23.2	0.0	11.9
LOS by Move:	A	C	A	A	D	A	A	A	A	C	A	B
HCM2kAvgQ:	0	13	0	0	17	0	0	0	0	21	0	7

Note: Queue reported is the number of cars per lane.

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---------------------------------------------------------------------------
                         Rowland Heights Plaza
                         Existing Plus Project
                       Weekday Morning Peak Hour
---------------------------------------------------------------------------

                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
***************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
***************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):        0.626
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):      23.6
Optimal Cycle:       100              Level Of Service:                 C
***************************************************************************
Street Name:              Nogales Street               SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Ignore           Ignore           Include          Include
Min. Green:   0     7     7   0     7     7   7     0     7   0     0     0
Lanes:        0  0  3  0  1   0  0  3  0  1   1  0  1! 0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1049   387     0  926   212   401    0   243     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1049   387     0  926   212   401    0   243     0    0     0
Added Vol:      0   57     0     0   42    43     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 1106   387     0  968   255   401    0   243     0    0     0
User Adj:    1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.00  0.94 0.94  0.00  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:     0 1183     0     0 1035     0   429    0   260     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1183     0     0 1035     0   429    0   260     0    0     0
PCE Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 1183     0     0 1035     0   429    0   260     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.91  1.00  1.00 0.91  1.00  0.73 1.00  0.76  1.00 1.00  1.00
Lanes:       0.00 3.00  1.00  0.00 3.00  1.00  1.46 0.00  0.54  0.00 0.00  0.00
Final Sat.:     0 5187  1900     0 5187  1900  2028    0   775     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.23  0.00  0.00 0.20  0.00  0.21 0.00  0.34  0.00 0.00  0.00
Crit Moves:       ****                                    ****
Green/Cycle: 0.00 0.36  0.00  0.00 0.36  0.00  0.54 0.00  0.54  0.00 0.00  0.00
Volume/Cap:  0.00 0.63  0.00  0.00 0.55  0.00  0.39 0.00  0.63  0.00 0.00  0.00
Delay/Veh:    0.0 26.9   0.0   0.0 25.6   0.0  13.8  0.0  17.4   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 26.9   0.0   0.0 25.6   0.0  13.8  0.0  17.4   0.0  0.0   0.0
LOS by Move:    A    C     A     A    C     A     B    A     B     A    A     A
HCM2kAvgQ:      0   12     0     0   10     0     5    0    11     0    0     0
***************************************************************************
Note: Queue reported is the number of cars per lane.
```

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------------------------------------------------------------------------------
                          Rowland Heights Plaza
                        Existing Plus Project
                       Weekday Evening Peak Hour
------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
******************************************************************************
Cycle (sec):         100             Critical Vol./Cap.(X):         0.841
Loss Time (sec):      10 (Y+R=0.0 sec) Average Delay (sec/veh):      27.9
Optimal Cycle:       100             Level Of Service:                  C
******************************************************************************
Street Name:              Nogales Street            SR-60 Freeway EB Ramps
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:            Ignore           Ignore          Include          Include
Min. Green:     0     7     7   0     7     7   7     0     7   0     0     0
Lanes:          0  0  3  0  1   0  0  3  0  1   1  0  1! 0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0   840   288   0  1322   287  397     0   420   0     0     0
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:    0   840   288   0  1322   287  397     0   420   0     0     0
Added Vol:      0    85     0   0    74    71    0     0     0   0     0     0
PasserByVol:    0     0     0   0     0     0    0     0     0   0     0     0
Initial Fut:    0   925   288   0  1396   358  397     0   420   0     0     0
User Adj:    1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.92  0.92  0.00 0.92  0.92  0.00 0.92  0.92  0.92 0.92  0.92  0.92
PHF Volume:     0  1004     0   0  1516     0  431     0   456   0     0     0
Reduct Vol:     0     0     0   0     0     0    0     0     0   0     0     0
Reduced Vol:    0  1004     0   0  1516     0  431     0   456   0     0     0
PCE Adj:     1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:    0  1004     0   0  1516     0  431     0   456   0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900  1900
Adjustment:  1.00  0.91  1.00 1.00  0.91  1.00 0.74  1.00  0.77 1.00  1.00  1.00
Lanes:       0.00  3.00  1.00 0.00  3.00  1.00 1.33  0.00  0.67 0.00  0.00  0.00
Final Sat.:     0  5187  1900   0  5187  1900 1871     0   982   0     0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.19  0.00 0.00  0.29  0.00 0.23  0.00  0.46 0.00  0.00  0.00
Crit Moves:                         ****                    ****
Green/Cycle: 0.00  0.35  0.00 0.00  0.35  0.00 0.55  0.00  0.55 0.00  0.00  0.00
Volume/Cap:  0.00  0.56  0.00 0.00  0.84  0.00 0.42  0.00  0.84 0.00  0.00  0.00
Delay/Veh:    0.0  26.8   0.0  0.0  33.8   0.0 13.2   0.0  24.9  0.0   0.0   0.0
User DelAdj: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
AdjDel/Veh:   0.0  26.8   0.0  0.0  33.8   0.0 13.2   0.0  24.9  0.0   0.0   0.0
LOS by Move:    A     C     A    A     C     A    B     A     C    A     A     A
HCM2kAvgQ:      0     9     0    0    18     0    6     0    20    0     0     0
******************************************************************************
Note: Queue reported is the number of cars per lane.
```

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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
                         Existing Plus Project
                          Saturday Peak Hour
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.725
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):        25.7
Optimal Cycle:        100              Level Of Service:                  C
********************************************************************************
Street Name:           Nogales Street                 SR-60 Freeway EB Ramps
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Ignore           Ignore           Include          Include
Min. Green:    0    7    7    0    7    7    7    0    7    0    0    0
Lanes:        0  0  3  0  1   0  0  3  0  1   1  0  1! 0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        0  947   423     0 1160   370   415    0   352     0    0     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0  947   423     0 1160   370   415    0   352     0    0     0
Added Vol:       0  107     0     0   99    92     0    0     0     0    0     0
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:     0 1054   423     0 1259   462   415    0   352     0    0     0
User Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.97 0.97  0.00  0.97 0.97  0.00  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:      0 1087     0     0 1298     0   428    0   363     0    0     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:     0 1087     0     0 1298     0   428    0   363     0    0     0
PCE Adj:      1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:     0 1087     0     0 1298     0   428    0   363     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:   1.00 0.91  1.00  1.00 0.91  1.00  0.74 1.00  0.77  1.00 1.00  1.00
Lanes:        0.00 3.00  1.00  0.00 3.00  1.00  1.38 0.00  0.62  0.00 0.00  0.00
Final Sat.:      0 5187  1900     0 5187  1900  1929    0   901     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.00 0.21  0.00  0.00 0.25  0.00  0.22 0.00  0.40  0.00 0.00  0.00
Crit Moves:                         ****                     ****
Green/Cycle:  0.00 0.34  0.00  0.00 0.34  0.00  0.56 0.00  0.56  0.00 0.00  0.00
Volume/Cap:   0.00 0.61  0.00  0.00 0.73  0.00  0.40 0.00  0.73  0.00 0.00  0.00
Delay/Veh:     0.0 27.7   0.0   0.0 30.1   0.0  12.9  0.0  19.0   0.0  0.0   0.0
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:    0.0 27.7   0.0   0.0 30.1   0.0  12.9  0.0  19.0   0.0  0.0   0.0
LOS by Move:     A    C     A     A    C     A     B    A     B     A    A     A
HCM2kAvgQ:       0   11     0     0   14     0     6    0    15     0    0     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
```

Existing Plus Project Plus Cumulative

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--------------------------------------------------------------------------------
                          Rowland Heights Plaza
               Existing Plus Project Plus Cumulative Projects
                          Weekday Morning Peak Hour
--------------------------------------------------------------------------------

                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.555
Loss Time (sec):       10 (Y+R=0.0 sec)  Average Delay (sec/veh):       20.3
Optimal Cycle:        100                Level Of Service:                 C
********************************************************************************
Street Name:              Fullerton Road              SR-60 Freeway WB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Ignore           Include          Include          Include
Min. Green:     0     7     7    0     7     0    0     0     0    7     0     7
Lanes:         0  0  3  0  1    0  0  3  0  0    0  0  0  0  0    1  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  1004   323    0   604     0    0     0     0   391     0   573
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:    0  1004   323    0   604     0    0     0     0   391     0   573
Added Vol:      0   112     3    0    84     0    0     0     0     4     0     0
PasserByVol:    0     0     0    0     0     0    0     0     0     0     0     0
Initial Fut:    0  1116   326    0   688     0    0     0     0   395     0   573
User Adj:    1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.94  0.94  0.00  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94
PHF Volume:     0  1188     0    0   733     0    0     0     0   421     0   610
Reduct Vol:     0     0     0    0     0     0    0     0     0     0     0     0
Reduced Vol:    0  1188     0    0   733     0    0     0     0   421     0   610
PCE Adj:     1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  0.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:    0  1188     0    0   733     0    0     0     0   421     0   610
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment:  1.00  0.91  1.00  1.00  0.91  1.00  1.00  1.00  1.00  0.75  1.00  0.75
Lanes:       0.00  3.00  1.00  0.00  3.00  0.00  0.00  0.00  0.00  1.41  0.00  1.59
Final Sat.:     0  5187  1900    0  5187     0    0     0     0  1999     0  2260
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.23  0.00  0.00  0.14  0.00  0.00  0.00  0.00  0.21  0.00  0.27
Crit Moves:        ****                                                       ****
Green/Cycle: 0.00  0.41  0.00  0.00  0.41  0.00  0.00  0.00  0.00  0.49  0.00  0.49
Volume/Cap:  0.00  0.55  0.00  0.00  0.34  0.00  0.00  0.00  0.00  0.43  0.00  0.55
Delay/Veh:    0.0  22.7   0.0   0.0  20.2   0.0   0.0   0.0   0.0  16.8   0.0  18.4
User DelAdj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:   0.0  22.7   0.0   0.0  20.2   0.0   0.0   0.0   0.0  16.8   0.0  18.4
LOS by Move:    A     C     A    A     C     A    A     A     A     B     A     B
HCM2kAvgQ:      0    10     0    0     6     0    0     0     0     6     0     9
********************************************************************************
Note: Queue reported is the number of cars per lane.
```

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2

Cycle (sec):	100	Critical Vol./Cap.(X):	0.454
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	17.1
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Fullerton Road						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Include			Include			Include		
Min. Green:	0	7	7	0	7	0	0	0	0	7	0	7
Lanes:	0 0	3 0	1	0 0	3 0	0	0 0	0 0	0	1 0	1! 0	1
Volume Module:												
Base Vol:	0	709	532	0	1049	0	0	0	0	368	0	334
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	709	532	0	1049	0	0	0	0	368	0	334
Added Vol:	0	151	4	0	137	0	0	0	0	4	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	860	536	0	1186	0	0	0	0	372	0	334
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.00	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	0	875	0	0	1207	0	0	0	0	378	0	340
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	875	0	0	1207	0	0	0	0	378	0	340
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	875	0	0	1207	0	0	0	0	378	0	340
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.74	1.00	0.74
Lanes:	0.00	3.00	1.00	0.00	3.00	0.00	0.00	0.00	0.00	1.53	0.00	1.47
Final Sat.:	0	5187	1900	0	5187	0	0	0	0	2145	0	2070
Capacity Analysis Module:												
Vol/Sat:	0.00	0.17	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.18	0.00	0.16
Crit Moves:					****					****		
Green/Cycle:	0.00	0.51	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.39	0.00	0.39
Volume/Cap:	0.00	0.33	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.45	0.00	0.42
Delay/Veh:	0.0	14.4	0.0	0.0	15.7	0.0	0.0	0.0	0.0	22.9	0.0	22.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	14.4	0.0	0.0	15.7	0.0	0.0	0.0	0.0	22.9	0.0	22.6
LOS by Move:	A	B	A	A	B	A	A	A	A	C	A	C
HCM2kAvgQ:	0	6	0	0	9	0	0	0	0	6	0	5

Note: Queue reported is the number of cars per lane.

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Saturday Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #2 Fullerton Road (NS) at SR-60 Freeway WB Ramps (EW) - #2

Cycle (sec):	100	Critical Vol./Cap.(X):	0.586
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	20.5
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Fullerton Road						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Include			Include			Include		
Min. Green:	0	7	7	0	7	0	0	0	0	7	0	7
Lanes:	0 0	3	0 1	0 0	3	0 0	0 0	0	0 0	1 0	1!	0 1
Volume Module:												
Base Vol:	0	744	579	0	1097	0	0	0	0	549	0	494
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	744	579	0	1097	0	0	0	0	549	0	494
Added Vol:	0	191	6	0	179	0	0	0	0	5	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	935	585	0	1276	0	0	0	0	554	0	494
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.00	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	0	978	0	0	1335	0	0	0	0	579	0	517
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	978	0	0	1335	0	0	0	0	579	0	517
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	978	0	0	1335	0	0	0	0	579	0	517
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.74	1.00	0.74
Lanes:	0.00	3.00	1.00	0.00	3.00	0.00	0.00	0.00	0.00	1.53	0.00	1.47
Final Sat.:	0	5187	1900	0	5187	0	0	0	0	2142	0	2062
Capacity Analysis Module:												
Vol/Sat:	0.00	0.19	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.27	0.00	0.25
Crit Moves:					****					****		
Green/Cycle:	0.00	0.44	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.46	0.00	0.46
Volume/Cap:	0.00	0.43	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.59	0.00	0.54
Delay/Veh:	0.0	19.5	0.0	0.0	21.6	0.0	0.0	0.0	0.0	20.4	0.0	19.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	19.5	0.0	0.0	21.6	0.0	0.0	0.0	0.0	20.4	0.0	19.7
LOS by Move:	A	B	A	A	C	A	A	A	A	C	A	B
HCM2kAvgQ:	0	8	0	0	12	0	0	0	0	9	0	8

Note: Queue reported is the number of cars per lane.

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                          Rowland Heights Plaza
                Existing Plus Project Plus Cumulative Projects
                         Weekday Morning Peak Hour
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                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):          0.593
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):         19.3
Optimal Cycle:        100              Level Of Service:                  B
********************************************************************************
Street Name:               Fullerton Road               SR-60 Freeway EB Ramps
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:         Permitted         Protected        Split Phase       Split Phase
Rights:           Include            Ignore            Ignore            Include
Min. Green:     0     7     7     7     7     7     7     7     7     7     0     7
Lanes:         0  0  1  1  0    1  0  2  0  1    1  1  0  0  1    2  0  0  0  1
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:       0  1278    15    12   684   217   410    10   552     5     0    18
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:    0  1278    15    12   684   217   410    10   552     5     0    18
Added Vol:      0    50    13     7    37     0    59     4     1    10     0     8
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:    0  1328    28    19   721   217   469    14   553    15     0    26
User Adj:    1.00  1.00  1.00  1.00  1.00  0.00  1.00  1.00  0.00  1.00  1.00  1.00
PHF Adj:     0.98  0.98  0.98  0.98  0.98  0.00  0.98  0.98  0.00  0.98  0.98  0.98
PHF Volume:     0  1350    28    19   733     0   477    14     0    15     0    26
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:    0  1350    28    19   733     0   477    14     0    15     0    26
PCE Adj:     1.00  1.00  1.00  1.00  1.00  0.00  1.00  1.00  0.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  0.00  1.00  1.00  0.00  1.00  1.00  1.00
FinalVolume:    0  1350    28    19   733     0   477    14     0    15     0    26
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment:  1.00  0.95  0.95  0.95  0.95  1.00  0.95  0.95  1.00  0.92  1.00  0.85
Lanes:       0.00  1.96  0.04  1.00  2.00  1.00  1.94  0.06  1.00  2.00  0.00  1.00
Final Sat.:     0  3525    74  1805  3610  1900  3520   105  1900  3502     0  1615
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.38  0.38  0.01  0.20  0.00  0.14  0.14  0.00  0.00  0.00  0.02
Crit Moves:        ****        ****                    ****        ****
Green/Cycle: 0.00  0.56  0.56  0.07  0.63  0.00  0.20  0.20  0.00  0.07  0.00  0.07
Volume/Cap:  0.00  0.68  0.68  0.15  0.32  0.00  0.68  0.68  0.00  0.06  0.00  0.23
Delay/Veh:    0.0  16.5  16.5  44.3   8.6   0.0  39.8  39.8   0.0  43.5   0.0  45.0
User DelAdj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:   0.0  16.5  16.5  44.3   8.6   0.0  39.8  39.8   0.0  43.5   0.0  45.0
LOS by Move:    A     B     B     D     A     A     D     D     A     D     A     D
HCM2kAvgQ:      0    16    16     1     5     0     8     8     0     0     0     1
********************************************************************************
Note: Queue reported is the number of cars per lane.
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Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3

Cycle (sec):	100	Critical Vol./Cap.(X):	0.587
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	16.0
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Fullerton Road						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Ignore			Include		
Min. Green:	0	7	7	7	7	7	7	7	7	7	0	7
Lanes:	0 0	1	1 0	1 0	2	0 1	1 1	0	0 1	2 0	0	0 1
Volume Module:												
Base Vol:	0	1259	36	44	834	265	201	17	538	31	0	57
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1259	36	44	834	265	201	17	538	31	0	57
Added Vol:	0	71	15	8	62	0	78	4	1	11	0	9
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1330	51	52	896	265	279	21	539	42	0	66
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.00	0.96	0.96	0.00	0.96	0.96	0.96
PHF Volume:	0	1383	53	54	931	0	290	22	0	44	0	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1383	53	54	931	0	290	22	0	44	0	69
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	0	1383	53	54	931	0	290	22	0	44	0	69
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.94	0.94	0.95	0.95	1.00	0.96	0.96	1.00	0.92	1.00	0.85
Lanes:	0.00	1.93	0.07	1.00	2.00	1.00	1.86	0.14	1.00	2.00	0.00	1.00
Final Sat.:	0	3456	133	1805	3610	1900	3379	254	1900	3502	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.40	0.40	0.03	0.26	0.00	0.09	0.09	0.00	0.01	0.00	0.04
Crit Moves:		****		****				****		****		
Green/Cycle:	0.00	0.62	0.62	0.07	0.69	0.00	0.13	0.13	0.00	0.07	0.00	0.07
Volume/Cap:	0.00	0.64	0.64	0.43	0.37	0.00	0.64	0.64	0.00	0.17	0.00	0.59
Delay/Veh:	0.0	12.4	12.4	46.9	6.4	0.0	43.9	43.9	0.0	43.9	0.0	52.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	12.4	12.4	46.9	6.4	0.0	43.9	43.9	0.0	43.9	0.0	52.5
LOS by Move:	A	B	B	D	A	A	D	D	A	D	A	D
HCM2kAvgQ:	0	15	15	2	6	0	6	6	0	1	0	3

Note: Queue reported is the number of cars per lane.

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                           Rowland Heights Plaza
              Existing Plus Project Plus Cumulative Projects
                            Saturday Peak Hour
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                      Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.832
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):        26.3
Optimal Cycle:        100               Level Of Service:                 C
********************************************************************************
Street Name:              Fullerton Road              SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:         Permitted        Protected       Split Phase      Split Phase
Rights:           Include          Ignore           Ignore           Include
Min. Green:     0     7     7    7     7     7    7     7     7    7     0     7
Lanes:         0  0  1  1  0   1  0  2  0  1   1  1  0  0  1   2  0  0  0  1
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:       0  1413    81  121   917   373  255    66   567   60     0   131
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:    0  1413    81  121   917   373  255    66   567   60     0   131
Added Vol:      0    89    19   10    82     0   99     5     1   17     0    14
PasserByVol:    0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:    0  1502   100  131   999   373  354    71   568   77     0   145
User Adj:    1.00  1.00  1.00 1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00
PHF Adj:     0.97  0.97  0.97 0.97  0.97  0.00 0.97  0.97  0.00 0.97  0.97  0.97
PHF Volume:     0  1548   103  135  1030     0  365    73     0   79     0   149
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:    0  1548   103  135  1030     0  365    73     0   79     0   149
PCE Adj:     1.00  1.00  1.00 1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  0.00 1.00  1.00  0.00 1.00  1.00  1.00
FinalVolume:    0  1548   103  135  1030     0  365    73     0   79     0   149
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900  1900
Adjustment:  1.00  0.94  0.94 0.95  0.95  1.00 0.96  0.96  1.00 0.92  1.00  0.85
Lanes:       0.00  1.88  0.12 1.00  2.00  1.00 1.67  0.33  1.00 2.00  0.00  1.00
Final Sat.:     0  3354   223 1805  3610  1900 3039   609  1900 3502     0  1615
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.46  0.46 0.07  0.29  0.00 0.12  0.12  0.00 0.02  0.00  0.09
Crit Moves:        ****       ****             ****                           ****
Green/Cycle: 0.00  0.55  0.55 0.09  0.64  0.00 0.14  0.14  0.00 0.11  0.00  0.11
Volume/Cap:  0.00  0.83  0.83 0.83  0.44  0.00 0.83  0.83  0.00 0.20  0.00  0.83
Delay/Veh:    0.0  21.6  21.6 73.8   9.0   0.0 52.5  52.5   0.0 40.7   0.0  70.4
User DelAdj: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
AdjDel/Veh:   0.0  21.6  21.6 73.8   9.0   0.0 52.5  52.5   0.0 40.7   0.0  70.4
LOS by Move:    A     C     C    E     A     A    D     D     A    D     A     E
HCM2kAvgQ:      0    24    24    6     8     0    9     9     0    1     0     7
********************************************************************************
Note: Queue reported is the number of cars per lane.
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                         Rowland Heights Plaza
             Existing Plus Project Plus Cumulative Projects
              Weekday Morning Peak Hour - With Improvements
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.463
Loss Time (sec):       10 (Y+R=0.0 sec) Average Delay (sec/veh):        19.0
Optimal Cycle:        100              Level Of Service:                 B
********************************************************************************
Street Name:              Fullerton Road                SR-60 Freeway EB Ramps
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Protected        Split Phase       Split Phase
Rights:          Include           Ignore            Ignore           Include
Min. Green:    0     7     7    7     7     7    7     7     7    7     0     7
Lanes:        0  0  2  1  0   1  0  2  0  1   1  1  0  0  1   2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1278    15    12  684   217   410   10   552     5    0    18
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1278    15    12  684   217   410   10   552     5    0    18
Added Vol:     0   50    13     7   37     0    59    4     1    10    0     8
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0 1328    28    19  721   217   469   14   553    15    0    26
User Adj:    1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
PHF Adj:     0.98 0.98  0.98  0.98 0.98  0.00  0.98 0.98  0.00  0.98 0.98  0.98
PHF Volume:    0 1350    28    19  733     0   477   14     0    15    0    26
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0 1350    28    19  733     0   477   14     0    15    0    26
PCE Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00
FinalVolume:   0 1350    28    19  733     0   477   14     0    15    0    26
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.91  0.91  0.95 0.95  1.00  0.95 0.95  1.00  0.92 1.00  0.85
Lanes:       0.00 2.94  0.06  1.00 2.00  1.00  1.94 0.06  1.00  2.00 0.00  1.00
Final Sat.:    0 5065   107  1805 3610  1900  3520  105  1900  3502    0  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.27  0.27  0.01 0.20  0.00  0.14 0.14  0.00  0.00 0.00  0.02
Crit Moves:       ****        ****                   ****        ****
Green/Cycle: 0.00 0.50  0.50  0.07 0.57  0.00  0.26 0.26  0.00  0.07 0.00  0.07
Volume/Cap:  0.00 0.53  0.53  0.15 0.35  0.00  0.53 0.53  0.00  0.06 0.00  0.23
Delay/Veh:    0.0 17.0  17.0  44.3 11.5   0.0  32.6 32.6   0.0  43.5  0.0  45.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 17.0  17.0  44.3 11.5   0.0  32.6 32.6   0.0  43.5  0.0  45.0
LOS by Move:    A    B     B     D    B     A     C    C     A     D    A     D
HCM2kAvgQ:      0   11    11     1    6     0     7    7     0     0    0     1
********************************************************************************
Note: Queue reported is the number of cars per lane.
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Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Evening Peak Hour - With Improvements

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3

Cycle (sec):	100	Critical Vol./Cap.(X):	0.452
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	16.6
Optimal Cycle:	100	Level Of Service:	B

Street Name:	Fullerton Road						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Ignore			Include		
Min. Green:	0	7	7	7	7	7	7	7	7	7	0	7
Lanes:	0 0 2 1 0			1 0 2 0 1			1 1 0 0 1			2 0 0 0 1		
Volume Module:												
Base Vol:	0	1259	36	44	834	265	201	17	538	31	0	57
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1259	36	44	834	265	201	17	538	31	0	57
Added Vol:	0	71	15	8	62	0	78	4	1	11	0	9
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1330	51	52	896	265	279	21	539	42	0	66
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.00	0.96	0.96	0.00	0.96	0.96	0.96
PHF Volume:	0	1383	53	54	931	0	290	22	0	44	0	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1383	53	54	931	0	290	22	0	44	0	69
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	0	1383	53	54	931	0	290	22	0	44	0	69
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.90	0.90	0.95	0.95	1.00	0.96	0.96	1.00	0.92	1.00	0.85
Lanes:	0.00	2.89	0.11	1.00	2.00	1.00	1.86	0.14	1.00	2.00	0.00	1.00
Final Sat.:	0	4965	190	1805	3610	1900	3379	254	1900	3502	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.28	0.28	0.03	0.26	0.00	0.09	0.09	0.00	0.01	0.00	0.04
Crit Moves:		****		****				****		****		
Green/Cycle:	0.00	0.56	0.56	0.07	0.63	0.00	0.17	0.17	0.00	0.09	0.00	0.09
Volume/Cap:	0.00	0.49	0.49	0.43	0.41	0.00	0.50	0.50	0.00	0.13	0.00	0.45
Delay/Veh:	0.0	13.4	13.4	46.9	9.2	0.0	38.0	38.0	0.0	41.7	0.0	45.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	13.4	13.4	46.9	9.2	0.0	38.0	38.0	0.0	41.7	0.0	45.0
LOS by Move:	A	B	B	D	A	A	D	D	A	D	A	D
HCM2kAvgQ:	0	10	10	2	7	0	5	5	0	1	0	3

Note: Queue reported is the number of cars per lane.

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Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Saturday Peak Hour - With Improvements

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Fullerton Road (NS) at SR-60 Freeway EB Ramps (EW) - #3

Cycle (sec):	100	Critical Vol./Cap.(X):	0.676
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	23.8
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Fullerton Road						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Ignore			Include		
Min. Green:	0	7	7	7	7	7	7	7	7	7	0	7
Lanes:	0 0 2 1 0			1 0 2 0 1			1 1 0 0 1			2 0 0 0 1		
Volume Module:												
Base Vol:	0	1413	81	121	917	373	255	66	567	60	0	131
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1413	81	121	917	373	255	66	567	60	0	131
Added Vol:	0	89	19	10	82	0	99	5	1	17	0	14
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1502	100	131	999	373	354	71	568	77	0	145
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.00	0.97	0.97	0.00	0.97	0.97	0.97
PHF Volume:	0	1548	103	135	1030	0	365	73	0	79	0	149
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1548	103	135	1030	0	365	73	0	79	0	149
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	0	1548	103	135	1030	0	365	73	0	79	0	149
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.90	0.90	0.95	0.95	1.00	0.96	0.96	1.00	0.92	1.00	0.85
Lanes:	0.00	2.81	0.19	1.00	2.00	1.00	1.67	0.33	1.00	2.00	0.00	1.00
Final Sat.:	0	4819	321	1805	3610	1900	3039	609	1900	3502	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.32	0.32	0.07	0.29	0.00	0.12	0.12	0.00	0.02	0.00	0.09
Crit Moves:		****		****			****					****
Green/Cycle:	0.00	0.48	0.48	0.11	0.59	0.00	0.18	0.18	0.00	0.14	0.00	0.14
Volume/Cap:	0.00	0.68	0.68	0.68	0.49	0.00	0.68	0.68	0.00	0.17	0.00	0.68
Delay/Veh:	0.0	21.1	21.1	51.7	12.2	0.0	41.3	41.3	0.0	38.3	0.0	49.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	21.1	21.1	51.7	12.2	0.0	41.3	41.3	0.0	38.3	0.0	49.2
LOS by Move:	A	C	C	D	B	A	D	D	A	D	A	D
HCM2kAvgQ:	0	15	15	5	10	0	8	8	0	1	0	6

Note: Queue reported is the number of cars per lane.

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Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16

Cycle (sec):	100	Critical Vol./Cap.(X):	0.764
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	26.0
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Ignore			Include			Include		
Min. Green:	0	7	7	0	7	7	0	0	0	7	0	7
Lanes:	0 0	3 0	1	0 0	3 0	1	0 0	0 0	0	0 0	1! 0	1
Volume Module:												
Base Vol:	0	1169	281	0	848	223	0	0	0	290	0	621
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1169	281	0	848	223	0	0	0	290	0	621
Added Vol:	0	57	0	0	85	0	0	0	0	1	0	59
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1226	281	0	933	223	0	0	0	291	0	680
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.00	0.97	0.97	0.00	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	0	1270	0	0	967	0	0	0	0	302	0	705
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1270	0	0	967	0	0	0	0	302	0	705
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1270	0	0	967	0	0	0	0	302	0	705
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.80	1.00	0.76
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	0.00	0.00	0.00	0.45	0.00	1.55
Final Sat.:	0	5187	1900	0	5187	1900	0	0	0	681	0	2238
Capacity Analysis Module:												
Vol/Sat:	0.00	0.24	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.44	0.00	0.31
Crit Moves:		****								****		
Green/Cycle:	0.00	0.32	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.58	0.00	0.58
Volume/Cap:	0.00	0.76	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.76	0.00	0.54
Delay/Veh:	0.0	32.7	0.0	0.0	28.9	0.0	0.0	0.0	0.0	18.6	0.0	13.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	32.7	0.0	0.0	28.9	0.0	0.0	0.0	0.0	18.6	0.0	13.2
LOS by Move:	A	C	A	A	C	A	A	A	A	B	A	B
HCM2kAvgQ:	0	14	0	0	10	0	0	0	0	17	0	9

Note: Queue reported is the number of cars per lane.

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                             Rowland Heights Plaza
                Existing Plus Project Plus Cumulative Projects
                           Weekday Evening Peak Hour
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                       Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16
********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):          0.773
Loss Time (sec):       10 (Y+R=0.0 sec)   Average Delay (sec/veh):         26.2
Optimal Cycle:        100                 Level Of Service:                   C
********************************************************************************
Street Name:              Nogales Street                SR-60 Freeway WB Ramps
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Ignore           Ignore          Include          Include
Min. Green:     0     7     7    0     7     7    0     0     0    7     0     7
Lanes:         0  0  3  0  1   0  0  3  0  1   0  0  0  0  0   0  0  1!  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1019   216     0 1226   454     0     0     0   383     0   262
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1019   216     0 1226   454     0     0     0   383     0   262
Added Vol:      0   85     0     0  145     0     0     0     0     1     0    78
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0 1104   216     0 1371   454     0     0     0   384     0   340
User Adj:    1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.00  0.93 0.93  0.00  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:     0 1183     0     0 1469     0     0     0     0   412     0   364
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:    0 1183     0     0 1469     0     0     0     0   412     0   364
PCE Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00  1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 1183     0     0 1469     0     0     0     0   412     0   364
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.91  1.00  1.00 0.91  1.00  1.00 1.00  1.00  0.77 1.00  0.74
Lanes:       0.00 3.00  1.00  0.00 3.00  1.00  0.00 0.00  0.00  0.68 0.00  1.32
Final Sat.:     0 5187  1900     0 5187  1900     0     0     0   998     0  1843
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.23  0.00  0.00 0.28  0.00  0.00 0.00  0.00  0.41 0.00  0.20
Crit Moves:                        ****                          ****
Green/Cycle: 0.00 0.37  0.00  0.00 0.37  0.00  0.00 0.00  0.00  0.53 0.00  0.53
Volume/Cap:  0.00 0.62  0.00  0.00 0.77  0.00  0.00 0.00  0.00  0.77 0.00  0.37
Delay/Veh:    0.0 26.6   0.0   0.0 30.0   0.0   0.0  0.0   0.0  22.3  0.0  13.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 26.6   0.0   0.0 30.0   0.0   0.0  0.0   0.0  22.3  0.0  13.7
LOS by Move:    A    C     A     A    C     A     A    A     A     C    A     B
HCM2kAvgQ:      0   11     0     0   16     0     0    0     0    16    0     5
********************************************************************************
Note: Queue reported is the number of cars per lane.
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Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Saturday Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #16 Nogales Street (NS) at SR-60 Freeway WB Ramps (EW) - #16

Cycle (sec):	100	Critical Vol./Cap.(X):	0.853
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	29.7
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						SR-60 Freeway WB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Ignore			Include			Include		
Min. Green:	0	7	7	0	7	7	0	0	0	7	0	7
Lanes:	0 0	3 0	1	0 0	3 0	1	0 0	0 0	0	0 0	1! 0	1
Volume Module:												
Base Vol:	0	991	364	0	1125	401	0	0	0	435	0	418
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	991	364	0	1125	401	0	0	0	435	0	418
Added Vol:	0	107	0	0	191	0	0	0	0	1	0	99
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1098	364	0	1316	401	0	0	0	436	0	517
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.00	0.95	0.95	0.00	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	1151	0	0	1379	0	0	0	0	457	0	542
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1151	0	0	1379	0	0	0	0	457	0	542
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1151	0	0	1379	0	0	0	0	457	0	542
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.78	1.00	0.74
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	0.00	0.00	0.00	0.62	0.00	1.38
Final Sat.:	0	5187	1900	0	5187	1900	0	0	0	911	0	1951
Capacity Analysis Module:												
Vol/Sat:	0.00	0.22	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.50	0.00	0.28
Crit Moves:					****					****		
Green/Cycle:	0.00	0.31	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.59	0.00	0.59
Volume/Cap:	0.00	0.71	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.85	0.00	0.47
Delay/Veh:	0.0	31.9	0.0	0.0	36.9	0.0	0.0	0.0	0.0	23.3	0.0	11.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	31.9	0.0	0.0	36.9	0.0	0.0	0.0	0.0	23.3	0.0	11.9
LOS by Move:	A	C	A	A	D	A	A	A	A	C	A	B
HCM2kAvgQ:	0	13	0	0	17	0	0	0	0	22	0	7

Note: Queue reported is the number of cars per lane.

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Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Morning Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17

Cycle (sec):	100	Critical Vol./Cap.(X):	0.626
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	23.6
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Ignore			Include			Include		
Min. Green:	0	7	7	0	7	7	7	0	7	0	0	0
Lanes:	0 0	3	0 1	0 0	3	0 1	1 0	1!	0 0	0 0	0	0 0
Volume Module:												
Base Vol:	0	1049	387	0	926	212	401	0	243	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1049	387	0	926	212	401	0	243	0	0	0
Added Vol:	0	57	0	0	43	43	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1106	387	0	969	255	401	0	243	0	0	0
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.00	0.94	0.94	0.00	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	0	1183	0	0	1036	0	429	0	260	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1183	0	0	1036	0	429	0	260	0	0	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1183	0	0	1036	0	429	0	260	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	0.73	1.00	0.76	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	1.46	0.00	0.54	0.00	0.00	0.00
Final Sat.:	0	5187	1900	0	5187	1900	2028	0	775	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.23	0.00	0.00	0.20	0.00	0.21	0.00	0.34	0.00	0.00	0.00
Crit Moves:		****							****			
Green/Cycle:	0.00	0.36	0.00	0.00	0.36	0.00	0.54	0.00	0.54	0.00	0.00	0.00
Volume/Cap:	0.00	0.63	0.00	0.00	0.55	0.00	0.39	0.00	0.63	0.00	0.00	0.00
Delay/Veh:	0.0	26.9	0.0	0.0	25.6	0.0	13.8	0.0	17.4	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	26.9	0.0	0.0	25.6	0.0	13.8	0.0	17.4	0.0	0.0	0.0
LOS by Move:	A	C	A	A	C	A	B	A	B	A	A	A
HCM2kAvgQ:	0	12	0	0	10	0	5	0	11	0	0	0

Note: Queue reported is the number of cars per lane.

Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Weekday Evening Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17

Cycle (sec):	100	Critical Vol./Cap.(X):	0.841
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	27.9
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Permitted			Permitted	
Rights:		Ignore			Ignore			Include			Include	
Min. Green:	0	7	7	0	7	7	7	0	7	0	0	0
Lanes:	0 0 3 0 1			0 0 3 0 1			1 0 1! 0 0			0 0 0 0 0		
Volume Module:												
Base Vol:	0	840	288	0	1322	287	397	0	420	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	840	288	0	1322	287	397	0	420	0	0	0
Added Vol:	0	85	0	0	75	71	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	925	288	0	1397	358	397	0	420	0	0	0
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.00	0.92	0.92	0.00	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	0	1004	0	0	1517	0	431	0	456	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1004	0	0	1517	0	431	0	456	0	0	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1004	0	0	1517	0	431	0	456	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	0.74	1.00	0.77	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	1.33	0.00	0.67	0.00	0.00	0.00
Final Sat.:	0	5187	1900	0	5187	1900	1871	0	982	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.19	0.00	0.00	0.29	0.00	0.23	0.00	0.46	0.00	0.00	0.00
Crit Moves:					****				****			
Green/Cycle:	0.00	0.35	0.00	0.00	0.35	0.00	0.55	0.00	0.55	0.00	0.00	0.00
Volume/Cap:	0.00	0.56	0.00	0.00	0.84	0.00	0.42	0.00	0.84	0.00	0.00	0.00
Delay/Veh:	0.0	26.8	0.0	0.0	33.8	0.0	13.2	0.0	24.9	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	26.8	0.0	0.0	33.8	0.0	13.2	0.0	24.9	0.0	0.0	0.0
LOS by Move:	A	C	A	A	C	A	B	A	C	A	A	A
HCM2kAvgQ:	0	9	0	0	18	0	6	0	20	0	0	0

Note: Queue reported is the number of cars per lane.

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Rowland Heights Plaza
Existing Plus Project Plus Cumulative Projects
Saturday Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #17 Nogales Street (NS) at SR-60 Freeway EB Ramps (EW) - #17

Cycle (sec):	100	Critical Vol./Cap.(X):	0.726
Loss Time (sec):	10 (Y+R=0.0 sec)	Average Delay (sec/veh):	25.7
Optimal Cycle:	100	Level Of Service:	C

Street Name:	Nogales Street						SR-60 Freeway EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Ignore			Include			Include		
Min. Green:	0	7	7	0	7	7	7	0	7	0	0	0
Lanes:	0 0	3	0 1	0 0	3	0 1	1 0	1!	0 0	0 0	0	0 0
Volume Module:												
Base Vol:	0	947	423	0	1160	370	415	0	352	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	947	423	0	1160	370	415	0	352	0	0	0
Added Vol:	0	107	0	0	101	92	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1054	423	0	1261	462	415	0	352	0	0	0
User Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.00	0.97	0.97	0.00	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	0	1087	0	0	1300	0	428	0	363	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1087	0	0	1300	0	428	0	363	0	0	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1087	0	0	1300	0	428	0	363	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	1.00	0.91	1.00	0.74	1.00	0.77	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	0.00	3.00	1.00	1.38	0.00	0.62	0.00	0.00	0.00
Final Sat.:	0	5187	1900	0	5187	1900	1929	0	901	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.21	0.00	0.00	0.25	0.00	0.22	0.00	0.40	0.00	0.00	0.00
Crit Moves:					****				****			
Green/Cycle:	0.00	0.35	0.00	0.00	0.35	0.00	0.55	0.00	0.55	0.00	0.00	0.00
Volume/Cap:	0.00	0.61	0.00	0.00	0.73	0.00	0.40	0.00	0.73	0.00	0.00	0.00
Delay/Veh:	0.0	27.7	0.0	0.0	30.1	0.0	12.9	0.0	19.1	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	27.7	0.0	0.0	30.1	0.0	12.9	0.0	19.1	0.0	0.0	0.0
LOS by Move:	A	C	A	A	C	A	B	A	B	A	A	A
HCM2kAvgQ:	0	11	0	0	14	0	6	0	15	0	0	0

Note: Queue reported is the number of cars per lane.

APPENDIX I

California Department of Transportation
Freeway Mainline Analysis

Table A

Opening Year (2019) Freeway Mainline Morning Peak Hour Operations Analysis

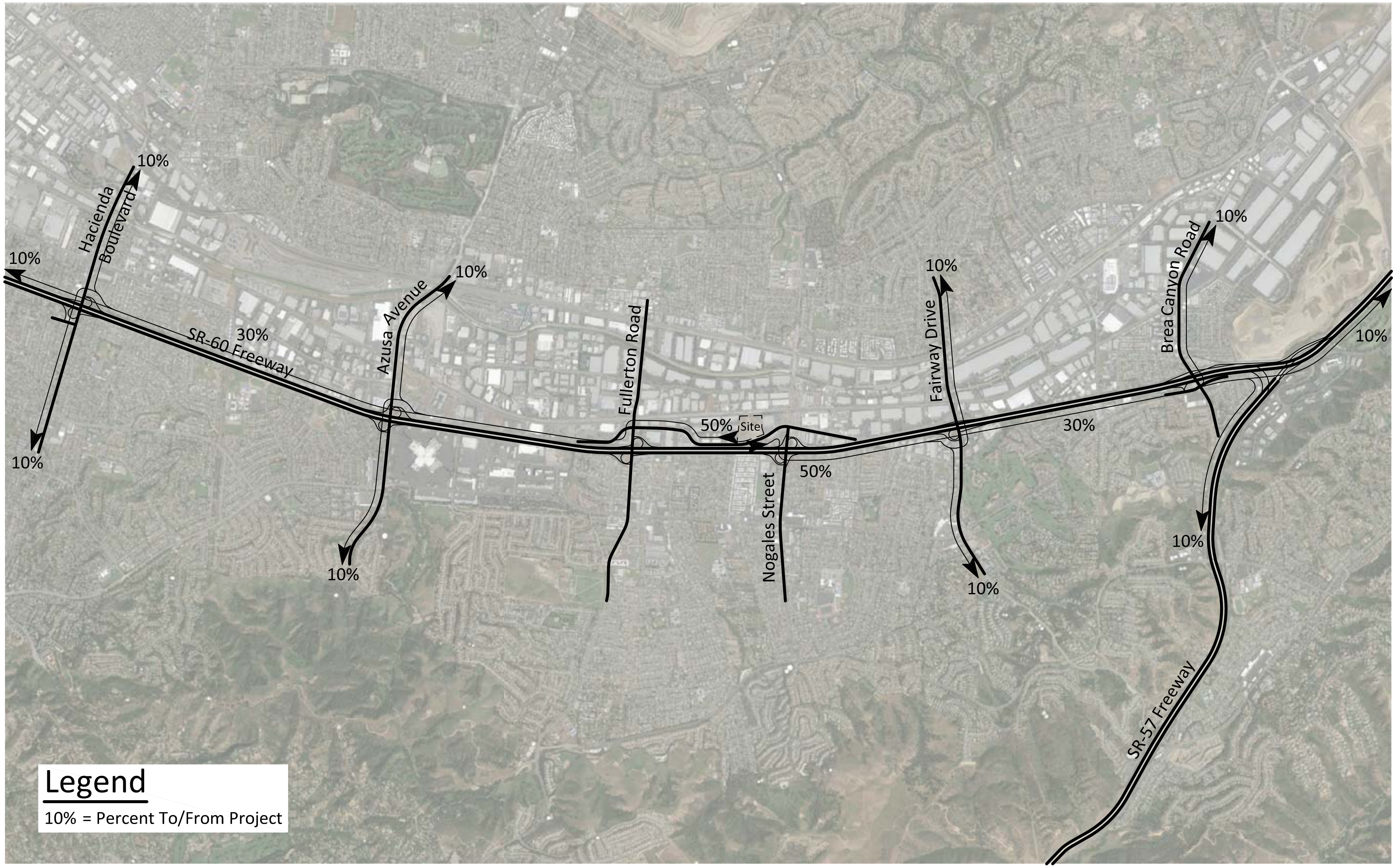
Freeway	Segment Limits	Lanes		Capacity	Project Trips	Opening Year (2019)					
						Without Project			With Project		
		Gen. Use	HOV			Trips	Vol/Cap	LOS	Trips	Vol/Cap	LOS
SR-60 Freeway WB	Grand Avenue to SR-57 Freeway	7	1	17,700	12	13,947	0.79	D	13,959	0.79	D
	SR-57 Freeway to Brea Canyon Road	4	1	10,800	24	8,479	0.79	D	8,503	0.79	D
	Brea Canyon Road to Fairway Drive	4	1	10,800	36	8,479	0.79	D	8,515	0.79	D
	Fairway Drive to Nogales Street	4	1	10,800	60	8,479	0.79	D	8,539	0.79	D
	Fullerton to Azusa Avenue	4	1	10,800	45	8,339	0.77	D	8,384	0.78	D
	Azusa Avenue to Hacienda Boulevard	4	1	10,800	27	7,429	0.69	C	7,456	0.69	C
SR-60 Freeway EB	Hacienda Boulevard to Azusa Avenue	4	1	10,800	36	8,652	0.80	D	8,688	0.80	D
	Azusa Avenue to Fullerton	4	1	10,800	60	8,372	0.78	D	8,432	0.78	D
	Nogales Street to Fairway Drive	4	1	10,800	45	6,334	0.59	C	6,379	0.59	C
	Fairway Drive to Brea Canyon Road	4	1	10,800	27	6,334	0.59	C	6,361	0.59	C
	Brea Canyon Road to SR-57 Freeway	4	1	10,800	18	6,334	0.59	C	6,352	0.59	C
	SR-57 Freeway Road to Grand Avenue	7	1	17,700	9	10,656	0.60	C	10,665	0.60	C
SR-57 Freeway NB	Pathfinder Road to SR-60 Freeway	5	1	13,100	12	5,166	0.39	B	5,178	0.40	B
SR-57 Freeway SB	SR-60 Freeway to Pathfinder Road	5	1	13,100	9	8,807	0.67	C	8,816	0.67	C

Table B

Opening Year (2019) Freeway Mainline Evening Peak Hour Operations Analysis

Freeway	Segment Limits	Lanes		Capacity	Project Trips	Opening Year (2019)					
						Without Project			With Project		
		Gen. Use	HOV			Trips	Vol/Cap	LOS	Trips	Vol/Cap	LOS
SR-60 Freeway WB	Grand Avenue to SR-57 Freeway	7	1	17,700	16	12,033	0.68	C	12,049	0.68	C
	SR-57 Freeway to Brea Canyon Road	4	1	10,800	32	8,119	0.75	C	8,151	0.75	C
	Brea Canyon Road to Fairway Drive	4	1	10,800	48	8,119	0.75	C	8,167	0.76	C
	Fairway Drive to Nogales Street	4	1	10,800	80	8,119	0.75	C	8,199	0.76	C
	Fullerton to Azusa Avenue	4	1	10,800	70	7,985	0.74	C	8,055	0.75	C
	Azusa Avenue to Hacienda Boulevard	4	1	10,800	42	7,542	0.70	C	7,584	0.70	C
SR-60 Freeway EB	Hacienda Boulevard to Azusa Avenue	4	1	10,800	48	9,102	0.84	D	9,150	0.85	D
	Azusa Avenue to Fullerton	4	1	10,800	60	8,808	0.82	D	8,868	0.82	D
	Nogales Street to Fairway Drive	4	1	10,800	70	8,757	0.81	D	8,827	0.82	D
	Fairway Drive to Brea Canyon Road	4	1	10,800	42	8,757	0.81	D	8,799	0.81	D
	Brea Canyon Road to SR-57 Freeway	4	1	10,800	28	8,757	0.81	D	8,785	0.81	D
	SR-57 Freeway to Grand Avenue	7	1	17,700	14	12,033	0.68	C	12,047	0.68	C
SR-57 Freeway NB	Pathfinder Road to SR-60 Freeway	5	1	13,100	16	7,109	0.54	C	7,125	0.54	C
SR-57 Freeway SB	SR-60 Freeway to Pathfinder Road	5	1	13,100	14	7,838	0.60	C	7,852	0.60	C

Figure A
Freeway Analysis Trip Distrbution



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Over 35 Years of Excellent Service

5089e/A

APPENDIX J

Intersection Improvement Striping Overlays

Figure A
Intersection #1 Striping Overlay

Kunzman Associates, Inc.

Over 35 Years of Excellent Service

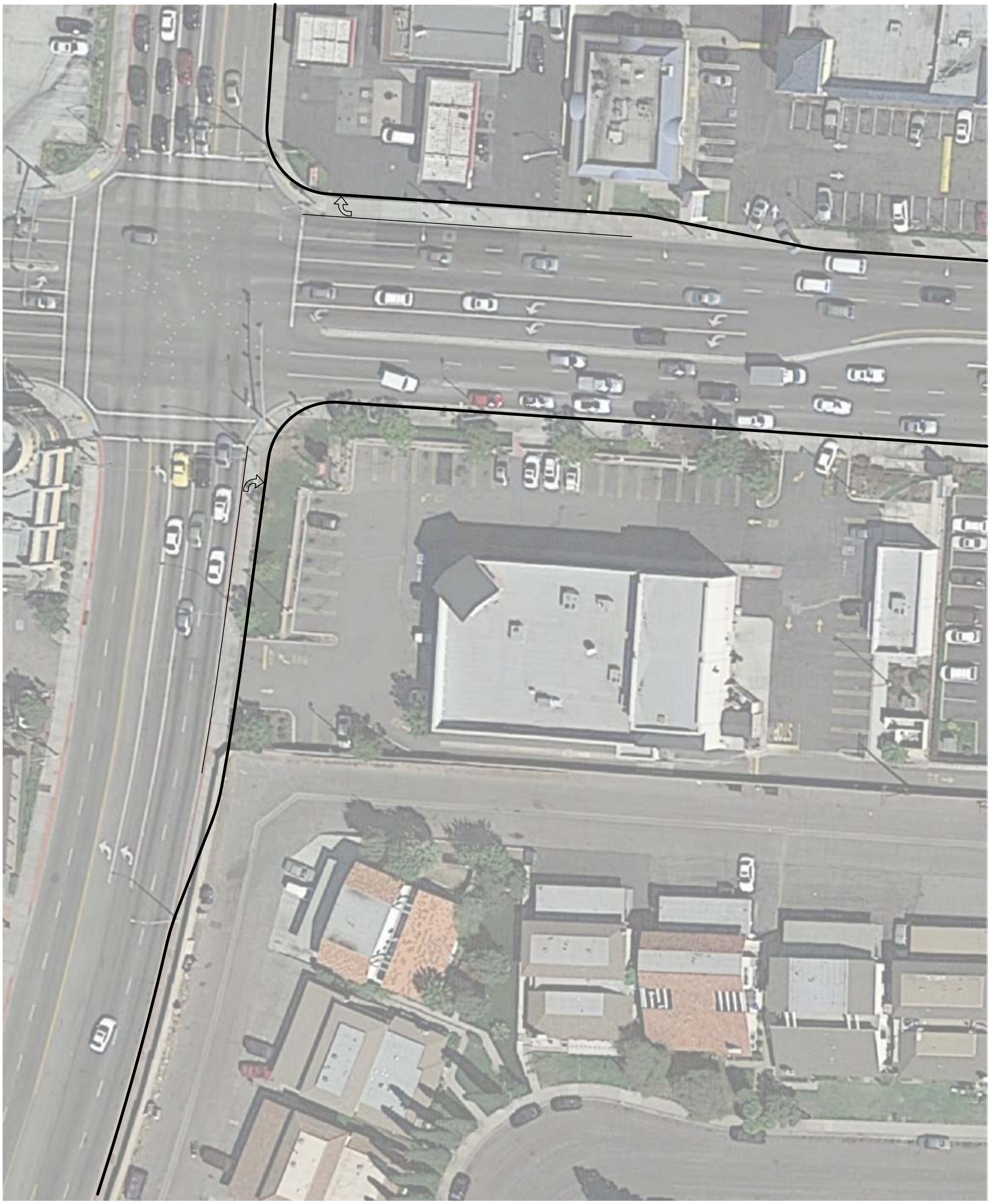
5089e/A

Figure B
Intersection #3 Striping Overlay

KUNZMAN ASSOCIATES, INC.
OVER 35 YEARS OF EXCELLENT SERVICE

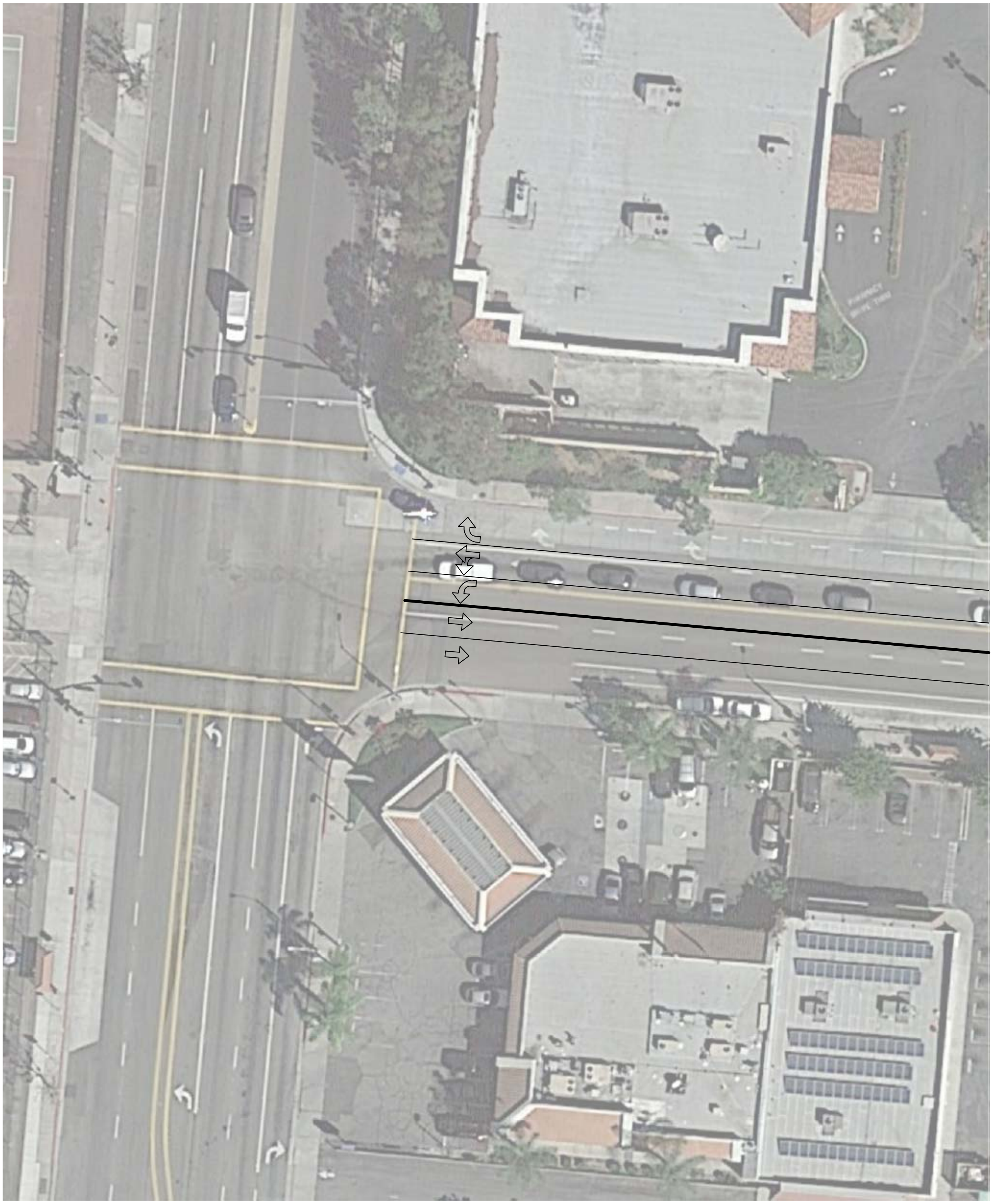
6089e/B

Figure C
Intersection #4 Striping Overlay



5089e/C

Figure D
Intersection #10 Striping Overlay



6089e/D

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Figure E
Intersection #18 Striping Overlay

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Orange, California 92868
(714) 973-8383

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I-2: PARKING ASSESSMENT

MEMORANDUM

To:	Parallax Investment Corporation	Date:	May 14, 2015
From:	David S. Shender, P.E. Linscott, Law & Greenspan, Engineers	LLG Ref:	5-15-0172-1
Subject:	**Parking Assessment for the Proposed Rowland Heights Plaza and Hotel Project** Rowland Heights area of unincorporated Los Angeles County		

LINSCOTT LAW & GREENSPAN engineers

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This memorandum has been prepared by Linscott, Law & Greenspan, Engineers (LLG) to provide a comprehensive parking assessment related to the proposed Rowland Heights Plaza and Hotel Project located in the Rowland Heights area of unincorporated Los Angeles County (the “Project”). The Project site is located on the north side of Gale Avenue and west of Nogales Street in Rowland Heights. This report provides a forecast of the Project’s potential parking demand. Details of the parking assessment prepared for the Project are provided in the following sections.

1.0 Executive Conclusions

Our conclusions related to the Project’s parking assessment are as follows:

- The Project proposes to provide 1,161 parking spaces on-site, inclusive of contiguous parking provided on property located within the adjacent City of Industry. A total of 1,503 off-street parking spaces would be required for the Project as proposed, based on the parking rates provided in the County Code. Based on nationally-accepted shared parking principles, this parking analysis forecasts a peak parking demand for 1,143 parking spaces for the Project at 8:00 p.m. on a weekend (Saturday), which is significantly less than the parking spaces required for the Project, based on the applicable rates provided in the County Code. It is therefore reasonable to forecast that the actual parking demand at the Project will be less than the Code requirement calculation and that the proposed 1,161 parking spaces are sufficient for the Project.

- In the event the Project is developed in phases, recommendations are provided for interim parking supplies for each phase to ensure an adequate supply of parking to accommodate the Project’s eventual build-out.

LINSCOTT LAW & GREENSPAN engineers

2.0 Proposed Project

The Project consists of a commercial development featuring a shopping plaza that includes retail, restaurant, and offices components (the "Shopping Plaza") and two adjacent hotels (the "Hotels"). ***Figure 1*** provides the Project's proposed site plan. The Project's specific proposed uses are:

<u>Shopping Plaza</u>

- 63,707 square feet of retail area
- 1,561 occupants (customers and staff), assumed to occupy 40,113 square feet of restaurant area (restaurant floorplans and each unit's associated occupancy loads will be determined at a future date, as discussed in detail in the next subsection)
- 20,000 square feet of potential medical office (which may be converted to retail area, since both carry the same parking demands as required by the Los Angeles County Code)
- 2,000 square feet of general office area

<u>Hotel A</u>

- 261 hotel guestrooms
- 14 hotel suites
- 10,000 square feet of ballroom area
- 2,000 square feet of meeting room space
- 6,000 square foot restaurant with floor area allocated as follows:
  - 4,200 square feet of seating area
  - 1,800 square feet of non-seating area

<u>Hotel B</u>

- 132 hotel guestrooms
- 70 hotel suites

The Project proposes to provide 1,161 parking spaces on-site in both surface parking areas and subterranean structures. Of these, 1,086 parking spaces would be located within the County unincorporated Project area (260 spaces on the Hotel A parcel, 137 spaces on the Hotel B parcel, and 689 spaces on the Shopping Plaza parcel) and 75 parking spaces would be located within the adjacent City of Industry Project area.

LINSCOTT LAW & GREENSPAN engineers

2.1 Restaurant Floor Area

The Project's restaurant floor plans (and therefore associated occupancy loads for each restaurant unit) are not currently designed, and therefore each unit's occupancy load is as yet unknown. Units designated for restaurant use will be designed for permitting purposes at a later date. In the absence of layouts, and in order to understand parking demand generated by the Project's restaurants, the Shopping Plaza's applicant has proposed to limit the Project's restaurant occupancy to 1,561 persons (including both customers and staff). With a maximum restaurant occupancy load of 1,561 persons, parking requirements can be confirmed in accordance with Section 22.52 of the Los Angeles County Code, and actual parking demands generated by this occupancy load can be analyzed. Prior to undertaking such analysis (which is found in the following sections), the developer's proposal for limiting occupancy is described.

Section 22.52 of the Los Angeles County Code mandates that one parking space shall be provided for every three occupants of a restaurant. In discussions with County staff, we understand that, for planning purposes in the absence of designed floor plans, we may make the following assumptions:

- The area of a restaurant where people sit to eat is the most dense portion of the restaurant (the "Seating Area"), and that the Seating Area carries an assumed density of one person per 15 square feet;

- The other areas of a restaurant, including the kitchen, point of sale, aisles, etc. (the "Non-Seating Area") is less dense and carries an assumed density of one person per 200 square feet; and

- A typical restaurant is designed such that on average 55% of the total area is dedicated as Seating Area, while 45% is dedicated as Non-Seating Area.

Since restaurant floors plans are currently unavailable, the Project's applicant is proposing to use the County's assumptions to guide restaurant floor area. As identified above, the Project's maximum restaurant occupancy load will never exceed 1,561 persons, inclusive of customers and staff. Using this figure and the above assumptions as discussed with County staff, 1,561 persons would occupy a minimum of 40,113 square feet of restaurant floor area within the Shopping Plaza. Details of these calculations are as follows:

• 40,113 s.f. * 55% * 1 person/15 s.f. =	1,471 occupants Seating Area
• 40,113 s.f. * 45% * 1 person/200 s.f. =	90 occupants Non-Seating Area
	1,561 occupants total

When restaurant floor plans are submitted for Director's Review, it may result in occupancy loads that are less dense than the above assumptions (e.g., 50% Seating Area). In this case, there may be an increase in restaurant floor area without an impact on occupancy loads, and therefore a net zero effect on parking demand will result despite the increased restaurant floor area. In such an event, the Project's applicant proposes to decrease the area of retail floor area in an amount corresponding to the increased area of restaurant. The Project applicant proposes to limit this potential corresponding increase in restaurant floor area to an absolute maximum restaurant floor area of 47,000 square feet. At 47,000 square feet of restaurant space with 1,561 occupants, there would be a consequential reduction in retail square footage and therefore a reduced total Shopping Plaza parking demand. To provide the most conservative analysis within this framework, this report analyzes 1,561 occupants in 40,113 square feet of restaurant space.

In order to give enforcement effect to the above analysis and control the Shopping Plaza's parking demand, the Project's applicant has proposed to employ the following language as a condition of approval:

> *The Shopping Plaza's maximum permitted occupancy load for all restaurant uses will never exceed 1,561 occupants (including both customer and staff) and total restaurant floor area shall not be less than 40,113 SF and will not exceed 47,000 SF. Restaurant occupancy loads shall be determined by the County Division of Building and Safety in accordance with the California Building Code in effect at the time when restaurant floor plans are submitted for Director's Reviews as required by the Department of Regional Planning.*
>
> *Restaurant occupancy restrictions will be controlled through the Shopping Plaza Association's CC&R. The Shopping Plaza Association (as maintained by the property manager) shall (i) keep records of each restaurant unit's maximum occupancy load, (ii) track the Shopping Plaza's total occupancy load and (iii) have the authority to enforce each restaurant unit's maximum permitted occupancy load. Prior to applying for a Director's Review, each restaurant unit owner shall obtain written authorization from the Shopping Plaza Association that confirms the occupancy load sought for permit accords with that unit's maximum permitted occupancy in accordance with the CC&R. Restaurant owners shall be prohibited from applying for a permit that seeks an occupancy load in excess of what is allowed, or building out a unit in excess of that unit's permitted maximum occupancy.*

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> *Once the Shopping Plaza Association has approved restaurant uses within the Plaza with a total of 1,561 occupants, no further restaurant uses may be approved by the Shopping Plaza Association. Occupant loads may be reallocated among restaurant unit owners with the prior approval of the Shopping Plaza Association (and such approvals from the County and Director's Review as are required by the County) but under no circumstances shall the total occupant load for all restaurant uses in the Shopping Plaza exceed 1,561 occupant spaces.*

3.0 Code Parking Calculation

Section 22.52 of the Los Angeles County Code provides off-street parking rates that are typically used to determine the amount of required parking for development projects. The County Code parking rates have been utilized within this parking demand analysis for purposes of determining the "baseline" parking demand for each component within the Project.

The County Code off-street parking rates applicable to the components of the Project are summarized below:

- Hotel Guestrooms: 1 space per 2 guestrooms
- Hotel Suites: 1 space per suite
- Function Space: 1 space per 3 occupants[1]
- Retail: 1 space per 250 square feet of floor area
- Restaurant: 1 space per 3 occupants[2]
- Medical Office: 1 space per 250 square feet of floor area
- General Office: 1 space per 400 square feet of floor area

Table 1 provides the parking requirement for the Project based on application of the unadjusted County Code parking rates. Taken together, the components of the Project would yield the requirement for 1,503 off-street parking spaces based on the rates provided in the County Code. This calculation is prepared, however, prior to consideration of shared parking factors that would substantially reduce the actual parking demand as compared to the County Code rates.

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[1] Based on feedback from County staff, occupancy for hotel function space (meeting rooms and banquet space) is estimated at 1 person per 15 square feet of floor area.
[2] Based on feedback from County staff, for planning purposes, occupancy for restaurants is estimated at 1 person per 15 square feet of seating area and 1 person per 200 square feet of non-seating area. Actual occupancy – and therefore required parking – is determined at the time of submittal of conceptual plans depicting restaurant seating layout in accordance with the California Building Code.

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4.0 Forecast Parking Demand

It can be reliably forecast that the actual parking demand at the Project will be less than what would otherwise be required by the County Code (i.e., 1,503 spaces). The calculation of parking required by the County Code is prepared prior to consideration of factors that would result in a substantially reduced parking demand at the Project. This is primarily based on the nationally-accepted shared parking principle as documented to be highly applicable for mixed-use developments such as the Project.

With shared parking, parking spaces can be shared throughout the day by employees and customers across the entire Project site, inclusive of the City of Industry parcel. For example, a Hotel guest would be permitted to park on the Shopping Plaza site in the evening during the peak hotel parking demand. Similarly, a retail customer would be able to park at one of the Hotel sites during the peak retail daytime parking demand. The concept of shared parking is discussed in more detail in a following section.

Parking demand forecast was prepared for the Project to determine the actual parking demand that can be reasonably anticipated at the Project based on application of the factors listed above. By "right-sizing" the on-site parking supply, the Project will limit the amount of on-site parking so as to discourage unnecessary travel by the private automobile, while providing a sufficient supply of on-site parking so as to limit the potential for adverse effects that may be associated with Project-related vehicles seeking parking options at off-site locations.

The second edition of the *Shared Parking* manual published by the Urban Land Institute (ULI) was consulted for purposes of preparing the parking demand analysis. The *Shared Parking* manual was prepared by the ULI through the collection and evaluation of parking utilization data for a variety of land uses (hotels, retail, restaurants, office, etc.) both on a "stand-alone" basis, as well as in a multi-use development setting. Based on the review of this data, the *Shared Parking* manual provides recommendations for adjusting baseline parking rates to account for variations in parking demand that occur throughout the day, as well as during the week.

For example, at a typical hotel, the highest demand for parking associated with the guestrooms typically occurs at night when nearly all hotel guests are at the site for the evening. Parking demand during the day at hotels – when many hotel guests area off-site – is substantially less. Thus, the ULI document provides hour-by-hour parking profiles (or indices) for land uses such as hotels expressed as a percentage of peak demand. For hotels, it is assumed that the guestrooms would generate 100% of its peak parking demand at 12:00 a.m. (midnight). However, during the daytime, the amount of parking generated by the guestrooms is much less (e.g., 55% of peak demand at 12:00 p.m. noon). Thus, a parking space used by a hotel guest in the

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evening can be used (shared) with a parker associated with another component in the Project (e.g., retail) that has a peak daytime parking demand.

Additionally, the ULI document provides guidance to users in regards to forecasting weekday vs. weekend parking demand for various land uses. For example, related to retail uses, there are differing levels of parking demand in comparing weekdays to Saturdays. Most retail uses generate their highest parking demand during the afternoon on a Saturday (as determined by the County Code, this would be equivalent to one parking space for every 250 square feet of retail floor area). However, during the weekday, the highest demand for parking generated by the retail use would be less than what is experienced during the weekend (i.e., the peak weekday parking demand for retail is approximately 10% less than the peak weekend parking demand according to the *Shared Parking* document).

Finally, the *Shared Parking* manual provides discussion of land uses that generate "captive" markets and therefore generate fewer parking spaces as compared to a "stand-alone" use. For example, restaurants located within a hotel typically generate fewer parking spaces as compared to similar restaurants that are developed on a single site, or even located within a commercial center. This is because: 1) many of the customers of these ancillary restaurant uses are expected to be guests of the Hotel (whose parking needs are already accounted for in the hotel parking requirement); and 2) being located in the same facility allows for the sharing of employees, storage and other back-of-house functions that cannot occur in stand-alone facilities.

Accordingly, application of the shared parking principle minimizes the need to unnecessarily duplicate parking supply at commercial projects if a single space can satisfy the parking needs of multiple project components.

Tables 2A and 2B provide the shared parking evaluations for the Project for a typical weekday and weekend (Saturday) condition. The following notes are provided in regards to the shared parking analysis:

- As previously noted, the County Code parking rates were used at the "baseline" parking demand rate for each component of the Project.

- Where applicable, adjustments to the baseline parking rate were made to account for differences in weekday vs. Saturday peak parking demand as recommended in the *Shared Parking* manual. For example, related to the hotel guestrooms, weekday demand was assumed to be 100% of peak demand while Saturday demand was assumed to be 86% of peak demand. Also, as previously noted, retail parking demand is assumed to have its highest peak hour Saturdays, but weekday parking demand would be 90% of peak.

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- The baseline parking rates related to the ancillary uses of Hotel A (the restaurant and function space) were reduced by 30% to account for captive market considerations. This is considered reasonable and conservative (by comparison, the City of West Hollywood Municipal Code allows for up to a 50% reduction in the regular City Code parking requirements for ancillary uses at hotels).

- The hour-by-hour parking demand indices for weekdays and Saturdays as provided in the *Shared Parking* document were applied to the adjusted baseline parking rates.

- As discussed in Section 2.1 Restaurant Floor Area above, for the floor area in the Shopping Plaza that could be developed as restaurant uses, the Shopping Plaza's total maximum permitted occupancy load for all restaurant uses will never exceed 1,561 occupant spaces (customers and staff) as determined by County staff through review of restaurant seating floor plans, and the total floor area permitted for Shopping Plaza restaurant uses will not exceed 47,000 square feet. As previously noted, the parking analysis conservatively assumes the 1,561 restaurant occupants would occupy 40,113 square feet of floor area based on the County staff guidance regarding assumed occupancy of restaurant space (1 person per 15 square feet of seating area, 1 person per 200 square feet of kitchen space, and 55% of overall floor area devoted to seating area). Should the restaurant floor area exceed 40,113 square feet at the Shopping Plaza (but the same maximum restaurant occupancy of 1,561 occupants), there would be less retail floor area, and therefore, a reduced parking demand for the overall Shopping Plaza. Thus, the analysis assumes the most conservative scenario that would exist within the constraints of the condition.

- For the 20,000 square feet of floor area in the Shopping Plaza that could be developed as either medical office or retail floor area, the parking analysis reviews the weekday parking demand assuming the area is occupied by medical office tenants (*Table 2A*), and the Saturday parking demand assumes the space occupied by retail tenants (*Table 2B*). Thus, the parking analysis sufficiently addresses the scenarios whereby the floor area is occupied by either by either retail or medical office use uses.

Table 2A indicates that the weekday peak parking demand for the Project is forecast to occur at 6:00 p.m. when 1,138 spaces would be needed. Similarly, *Table 2B* forecasts that 1,143 parking spaces would be needed on a Saturday at 8:00 p.m. to serve the Project.

Accordingly, the proposed on-site parking supply of 1,161 parking spaces would adequately accommodate the peak parking demand of the Project for both a weekday and Saturday condition.

This forecast demand is highly conservative ("worst case") as it assumes 100% utilization of the Project's hotel banquet floor area and Shopping Plaza restaurant floor area within the Shopping Plaza during the evening hours on weekdays and Saturdays. It is rare, for example, that all function space within a hotel is used simultaneously.[3] Also, some restaurants may focus to a dinner service while other food-serving tenants (e.g., many quick-serve-type restaurants) have their peak activity during the lunch period.[4] Therefore, it is likely that the parking demand will be substantially less (and the resultant surpluses of unused parking spaces higher) than the "worst case" forecast provided herein.

5.0 Phasing

The development of the Project may be phased such that individual components could be constructed separately. Phasing scenarios evaluated (with associated parking supply) include the following:

- Hotel A only: 330 spaces[5]
- Hotel A & B: 445 spaces[6]
- Shopping Plaza only: 810 spaces[7]
- Hotel A & Shopping Plaza: 1,075 spaces[8]

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[3] For example, for larger events, some area is used for pre-function space (e.g., appetizers and drinks), and then a separate area is used for a sit-down dinner. The two areas are not used to capacity simultaneously.

[4] The parking analysis conservatively assumes all of the restaurant space would have its peak activity during the dinner period (e.g., using the Fine/Casual Dining hourly parking profiles from the *Shared Parking* document). For comparison purposes, ***Tables 3A and 3B*** were prepared assuming the restaurant areas were occupied by tenants focusing on the lunchtime service (i.e., the Family Restaurant hourly parking profiles provided in the *Shared Parking* document). As shown in *Tables 3A and 3B*, the forecast peak parking demand is forecast to be slightly less (1,021 spaces for a weekday and 1,122 spaces for a Saturday) as compared to peak parking demand forecasts in *Tables 2A and 2B*. Therefore, this parking analysis suitably covers all types of food-serving uses that could occupy the proposed restaurant floor area in the Shopping Plaza.

[5] For the Hotel A scenario, 260 parking spaces would be provided on the Hotel A site and 70 temporary parking spaces on the Hotel B site.

[6] For the Hotel A & B scenario, 417 spaces would be provided on the combined Hotel A & B sites (inclusive of the 20 spaces on the City of Industry parcel), and 28 temporary parking spaces provided on the Shopping Plaza site.

[7] For the Shopping Plaza only scenario, 746 parking spaces would be provided on the Shopping Plaza site (inclusive of the 55 spaces on the City of Industry parcel) and 66 temporary parking spaces provided on either the Hotel A or Hotel B site.

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Table 4 below provides the forecast peak hour parking demand from *Tables 2A-2B* and *3A-3B* and provides a comparison to the proposed parking supply associated with each phase.

Table 4
Phased Parking Analysis

Phase	Peak Parking Demand	Parking Supply
Hotel A only	327 spaces (8:00 p.m. weekday – Tables 2A/3A)	330 spaces
Hotel A & B	442 spaces (9:00 p.m. weekday – Tables 2A/3A)	445 spaces
Shopping Plaza only	789 spaces (12:00 p.m. Saturday – Table 3B)	810 spaces
Hotel A & Shopping Plaza	1,057 spaces (12:00 p.m. Saturday – Table 3B)	1,075 spaces

As shown in *Table 4*, sufficient parking would be provided for the various components of the Project based on the eventual phasing. Temporary arrangements for parking during construction of individual components may be required as the Project approaches build-out. For example, if Hotel A relies on 70 temporary parking spaces on the Hotel B site, a parking management plan will be required at such time construction on the Hotel B site commences.

[8] For the Hotel A & Shopping Plaza scenario, 1,004 parking spaces would be provided on the Hotel A site and the Shopping Plaza site (inclusive of the 55 spaces on the City of Industry parcel) and 71 temporary parking spaces on the Hotel B site.

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6.0 Summary

This memorandum provides the parking assessment prepared for the proposed Rowland Heights Plaza and Hotel project located in the Rowland Heights area of unincorporated Los Angele County. The conclusions of the parking assessment are as follows:

- This study forecasts a peak parking demand for 1,143 parking spaces for the Project at 8:00 p.m. on a weekend (Saturday), which is significantly less than the amount of parking that would be required for the Project as calculated based on the applicable rates provided in the County Code.

- Based on the principles of shared parking as documented by the ULI, the Project's parking supply of 1,161 spaces would be sufficient to accommodate the forecast parking demand throughout all hours during a weekday and weekend condition. Based on the highly conservative assumptions utilized in preparing the parking demand forecasts, the actual parking surpluses will likely exceed the estimates provided herein.

- As the Project will likely be developed in phases, recommendations are provided herein for interim parking supplies for each phase to ensure an adequate supply of parking to accommodate the build-out of the development.

cc: File

TABLE 1
PRELIMINARY CODE PARKING CALCULATION [1]
ROWLAND HEIGHTS PLAZA AND HOTEL

6-May-15

Use	Size	Code Parking Rate	No. of Spaces
Hotel A			
Rooms	261 rooms	0.5 /room	131
Suites	14 suites	1 /suite	14
Banquet Room	10,000 s.f.	1 /3 occupants [1]	222
Meeting Room	2,000 s.f.	1 /3 occupants [1]	44
Restaurant	6,000 s.f.		
Customer Area	4,200 s.f.	1 /3 occupants [1]	93
Kitchen Area	1,800 s.f.	1 /3 occupants [1]	3
Subtotal Hotel A			507
Hotel B			
Rooms	132 rooms	0.5 /suite	66
Suites	70 suites	1 /suite	70
Subtotal Hotel B			136
Plaza			
Restaurant	40,113 s.f.		
Customer Area [3]	22,062 s.f.	1 /3 occupants [2]	490
Kitchen Area [3]	18,051 s.f.	1 /3 occupants [2]	30
Retail	63,707 s.f.	4 /1,000 s.f.	255
Medical Office or Retail	20,000 s.f.	4 /1,000 s.f.	80
General Office	2,000 s.f.	2.5 /1,000 s.f.	5
Subtotal Plaza			860
		Total	1,503

[1] Meeting and Banquet Room parking rate assumes 1 occupant per 15 square feet.
[2] Restaurant parking rate assumes 1 occupant per 15 square feet of customer area or 1 occupant per 200 square feet of kitchen area.
[3] Restaurant floor area in Plaza assumed to average 55% customer area and 45% kitchen on an aggregate basis.

TABLE 2A
WEEKDAY SHARED PARKING DEMAND ANALYSIS [1]
ROWLAND HEIGHTS PLAZA AND HOTEL

6-May-15

Land Use	Hotel A - Rooms	Hotel A - Suites	Hotel Banquet Space	Hotel Meeting Space	Hotel Restaurant		Retail	Medical Office / Retail [6]	Office	Restaurant [7]			Hotel B - Rooms	Hotel B - Suites		
Size	261 Rooms	14 Suites	10.0 KSF	2.0 KSF	6.0 KSF		63.707 KSF	20.0 KSF	2.0 KSF	40.113 KSF			132 Rms	70 Suites		
Peak Pkg Rate [2]	0.50 /Rm	1.00 /Ste	[4] /KSF	[4] /KSF	[5] /KSF		4.0 /KSF	4.0 /KSF	2.5 /KSF	[8] /KSF			0.50 /Rm	1.00 /Ste		
Weekday Pkg Rate [3]	0.50 /Rm	1.00 /Ste	[4] /KSF	[4] /KSF	[5] /KSF		3.6 /KSF	4.0 /KSF	2.5 /KSF	[8] /KSF			0.50 /Rm	1.00 /Ste		
Gross Spaces	131 Spc.	14 Spc.	222 Spc.	44 Spc.	96 Spc.		229 Spc.	80 Spc.	5 Spc.	468 Spc.			66 Spc.	70 Spc.		
Adjusted Gross Spaces [9]	131 Spc.	14 Spc.	155 Spc.	31 Spc.	67 Spc.		229 Spc.	80 Spc.	5 Spc.	468 Spc.			66 Spc.	70 Spc.		
Time of Day	Number of Spaces	Number of Spaces	Number of Spaces	Number of Spaces	Number of Spaces	Subtotal Hotel A Parking Demand	Number of Spaces	Number of Spaces	Number of Spaces	Number of Spaces	Subtotal Plaza Parking Demand	Subtotal Hotel A & Plaza Parking Demand	Number of Spaces	Number of Spaces	Subtotal Hotel A & Hotel B Parking Demand	Total Shared Parking Demand
6:00 AM	124	13	0	0	0	137	2	0	0	0	2	139	63	67	267	269
7:00 AM	118	13	0	0	7	138	11	0	2	0	13	151	59	63	260	273
8:00 AM	105	11	47	16	20	199	34	48	4	0	86	285	53	56	308	394
9:00 AM	92	10	93	31	7	233	80	80	5	0	165	398	46	49	328	493
10:00 AM	79	8	93	31	7	218	149	80	5	70	304	522	40	42	300	604
11:00 AM	79	8	93	31	3	214	195	80	5	187	467	681	40	42	296	763
12:00 PM	72	8	101	31	67	279	218	80	5	351	654	933	36	39	354	1,008
1:00 PM	72	8	101	31	67	279	229	80	5	351	665	944	36	39	354	1,019
2:00 PM	79	8	101	31	22	241	218	80	5	304	607	848	40	42	323	930
3:00 PM	79	8	101	31	7	226	206	80	5	187	478	704	40	42	308	786
4:00 PM	85	9	101	31	7	233	206	80	5	234	525	758	43	46	322	847
5:00 PM	92	10	155	31	20	308	218	80	3	351	652	960	46	49	403	1,055
6:00 PM	98	11	155	16	37	317	218	54	1	445	718	1,035	50	53	420	1,138
7:00 PM	98	11	155	9	40	313	218	24	1	468	711	1,024	50	53	416	1,127
8:00 PM	105	11	155	9	47	327	183	12	0	468	663	990	53	56	436	1,099
9:00 PM	111	12	155	3	45	326	115	0	0	468	583	909	56	60	442	1,025
10:00 PM	124	13	78	0	40	255	69	0	0	445	514	769	63	67	385	899
11:00 PM	131	14	0	0	27	172	23	0	0	351	374	546	66	70	308	682
12:00 AM	131	14	0	0	0	145	0	0	0	117	117	262	66	70	281	398

Notes:

[1] Hourly parking indices based on ULI - Urban Land Institute "Shared Parking," Second Edition, 2005.

[2] Peak parking rates for all land uses based on County Code.

[3] Weekday parking rates based on the weekday parking demand ratios, as summarized in Table 2-2 of the "Shared Parking" manual.

[4] Meeting and Banquet room Code parking rate based on 1 space per 3 occupants, assuming 1 occupant per 15 square feet.

[5] Hotel Restaurant Code parking rate based on 1 space per 3 occupants, assuming 4,200 square feet of customer area (1 occupant per 15 square feet) and 1,800 square feet of kitchen area (1 occupant per 200 square feet).

[6] To provide a "worst case" analysis, 20,000 square feet analyzed as Medical Office use for weekday parking and Retail use for weekend parking.

[7] Utilizes ULI hourly parking profile for Fine/Casual Dining Restaurant.

[8] Restaurant Code rate based on 1 space per 3 occupants, assuming 1 occupant per 15 square feet of customer area (55% of the restaurant) or 1 occupant per 200 square feet of kitchen area (45% of restaurant).

[9] Captive adjustment assumes 30% of Hotel Restaurant, Banquet, and Meeting Room occupants generated by Hotel guests.

TABLE 2B

WEEKEND SHARED PARKING DEMAND ANALYSIS [1]

ROWLAND HEIGHTS PLAZA AND HOTEL

6-May-15

Land Use	Hotel A - Rooms	Hotel A - Suites	Hotel Banquet Space	Hotel Meeting Space	Hotel Restaurant	Subtotal Hotel A Parking Demand	Retail	Medical Office / Retail [6]	Office	Restaurant [7]	Subtotal Plaza Parking Demand	Subtotal Hotel A & Plaza Parking Demand	Hotel B - Rooms	Hotel B - Suites	Subtotal Hotel A & Hotel B Parking Demand	Total Shared Parking Demand
Size	261 Rooms	14 Suites	10.0 KSF	2.0 KSF	6.0 KSF		63.707 KSF	20.0 KSF	2.0 KSF	40.113 KSF			132 Rms	70 Suites		
Peak Pkg Rate [2]	0.50 /Rm	1.00 /Ste	[4] /KSF	[4] /KSF	[5] /KSF		4.0 /KSF	4.0 /KSF	2.5 /KSF	[8] /KSF			0.50 /Rm	1.00 /Ste		
Weekend Pkg Rate [3]	0.43 /Rm	0.86 /Ste	[4] /KSF	[4] /KSF	[5] /KSF		4.0 /KSF	4.0 /KSF	0.3 /KSF	[8] /KSF			0.43 /Rm	0.86 /Ste		
Gross Spaces	113 Spc.	12 Spc.	222 Spc.	44 Spc.	96 Spc.		255 Spc.	80 Spc.	1 Spc.	520 Spc.			57 Spc.	60 Spc.		
Adjusted Gross Spaces [9]	113 Spc.	12 Spc.	155 Spc.	31 Spc.	67 Spc.		255 Spc.	80 Spc.	1 Spc.	520 Spc.			57 Spc.	60 Spc.		
Time of Day	Number of Spaces	Number of Spaces	Number of Spaces	Number of Spaces	Number of Spaces		Number of Spaces	Number of Spaces	Number of Spaces	Number of Spaces			Number of Spaces	Number of Spaces		
6:00 AM	107	11	0	0	0	118	3	1	0	0	4	122	54	57	229	233
7:00 AM	102	11	0	0	7	120	13	4	0	0	17	137	51	54	225	242
8:00 AM	90	10	47	16	20	183	26	8	1	0	35	218	46	48	277	312
9:00 AM	79	8	93	31	7	218	77	24	1	0	102	320	40	42	300	402
10:00 AM	68	7	93	31	7	206	128	40	1	0	169	375	34	36	276	445
11:00 AM	68	7	93	31	3	202	166	52	1	78	297	499	34	36	272	569
12:00 PM	62	7	101	31	67	268	204	64	1	260	529	797	31	33	332	861
1:00 PM	62	7	101	31	67	268	230	72	1	286	589	857	31	33	332	921
2:00 PM	68	7	101	31	22	229	255	80	1	234	570	799	34	36	299	869
3:00 PM	68	7	101	31	7	214	255	80	0	234	569	783	34	36	284	853
4:00 PM	73	8	101	31	7	220	242	76	0	234	552	772	37	39	296	848
5:00 PM	79	8	155	31	20	293	230	72	0	312	614	907	40	42	375	989
6:00 PM	85	9	155	16	37	302	204	64	0	468	736	1,038	43	45	390	1,126
7:00 PM	85	9	155	9	40	298	191	60	0	494	745	1,043	43	45	386	1,131
8:00 PM	90	10	155	9	47	311	166	52	0	520	738	1,049	46	48	405	1,143
9:00 PM	96	10	155	3	45	309	128	40	0	468	636	945	48	51	408	1,044
10:00 PM	107	11	78	0	40	236	89	28	0	468	585	821	54	57	347	932
11:00 PM	113	12	0	0	27	152	38	12	0	468	518	670	57	60	269	787
12:00 AM	113	12	0	0	0	125	0	0	0	260	260	385	57	60	242	502

Notes:

[1] Hourly parking indices based on ULI - Urban Land Institute "Shared Parking," Second Edition, 2005.

[2] Peak parking rates for all land uses based on County Code.

[3] Weekend parking rates reflect relationships between the weekend parking demand ratios and the peak parking demand ratios, as summarized in Table 2-2 of the "Shared Parking" manual.

[4] Meeting and Banquet room Code parking rate based on 1 space per 3 occupants, assuming 1 occupant per 15 square feet.

[5] Hotel Restaurant Code parking rate based on 1 space per 3 occupants, assuming 4,200 square feet of customer area (1 occupant per 15 square feet) and 1,800 square feet of kitchen area (1 occupant per 200 square feet).

[6] To provide a "worst case" analysis, 20,000 square feet analyzed as Medical Office use for weekday parking and Retail use for weekend parking.

[7] Utilizes ULI hourly parking profile for Fine/Casual Dining Restaurant.

[8] Restaurant Code rate based on 1 space per 3 occupants, assuming 1 occupant per 15 square feet of customer area (55% of the restaurant) or 1 occupant per 200 square feet of kitchen area (45% of restaurant).

[9] Captive adjustment assumes 30% of Hotel Restaurant, Banquet, and Meeting Room occupants generated by Hotel guests.

TABLE 3A

WEEKDAY SHARED PARKING DEMAND ANALYSIS [1]

ROWLAND HEIGHTS PLAZA AND HOTEL

6-May-15

Land Use	Hotel A - Rooms	Hotel A - Suites	Hotel Banquet Space	Hotel Meeting Space	Hotel Restaurant		Retail	Medical Office / Retail [6]	Office	Restaurant [7]			Hotel B - Rooms	Hotel B - Suites		
Size	261 Rooms	14 Suites	10.0 KSF	2.0 KSF	6.0 KSF		63.707 KSF	20.0 KSF	2.0 KSF	40.113 KSF			132 Rms	70 Suites		
Peak Pkg Rate [2]	0.50 /Rm	1.00 /Ste	[4] /KSF	[4] /KSF	[5] /KSF		4.0 /KSF	4.0 /KSF	2.5 /KSF	[8] /KSF			0.50 /Rm	1.00 /Ste		
Weekday Pkg Rate [3]	0.50 /Rm	1.00 /Ste	[4] /KSF	[4] /KSF	[5] /KSF		3.6 /KSF	4.0 /KSF	2.5 /KSF	[8] /KSF			0.50 /Rm	1.00 /Ste		
Gross Spaces	131 Spc.	14 Spc.	222 Spc.	44 Spc.	96 Spc.		229 Spc.	80 Spc.	5 Spc.	364 Spc.			66 Spc.	70 Spc.		
Adjusted Gross Spaces [9]	131 Spc.	14 Spc.	155 Spc.	31 Spc.	67 Spc.		229 Spc.	80 Spc.	5 Spc.	364 Spc.			66 Spc.	70 Spc.		
Time of Day	Number of Spaces	Number of Spaces	Number of Spaces	Number of Spaces	Number of Spaces	Subtotal Hotel A Parking Demand	Number of Spaces	Number of Spaces	Number of Spaces	Number of Spaces	Subtotal Plaza Parking Demand	Subtotal Hotel A & Plaza Parking Demand	Number of Spaces	Number of Spaces	Subtotal Hotel A & Hotel B Parking Demand	Total Shared Parking Demand
6:00 AM	124	13	0	0	0	137	2	0	0	91	93	230	63	67	267	360
7:00 AM	118	13	0	0	7	138	11	0	2	182	195	333	59	63	260	455
8:00 AM	105	11	47	16	20	199	34	48	4	218	304	503	53	56	308	612
9:00 AM	92	10	93	31	7	233	80	80	5	273	438	671	46	49	328	766
10:00 AM	79	8	93	31	7	218	149	80	5	309	543	761	40	42	300	843
11:00 AM	79	8	93	31	3	214	195	80	5	328	608	822	40	42	296	904
12:00 PM	72	8	101	31	67	279	218	80	5	364	667	946	36	39	354	1,021
1:00 PM	72	8	101	31	67	279	229	80	5	328	642	921	36	39	354	996
2:00 PM	79	8	101	31	22	241	218	80	5	182	485	726	40	42	323	808
3:00 PM	79	8	101	31	7	226	206	80	5	164	455	681	40	42	308	763
4:00 PM	85	9	101	31	7	233	206	80	5	164	455	688	43	46	322	777
5:00 PM	92	10	155	31	20	308	218	80	3	273	574	882	46	49	403	977
6:00 PM	98	11	155	16	37	317	218	54	1	291	564	881	50	53	420	984
7:00 PM	98	11	155	9	40	313	218	24	1	291	534	847	50	53	416	950
8:00 PM	105	11	155	9	47	327	183	12	0	291	486	813	53	56	436	922
9:00 PM	111	12	155	3	45	326	115	0	0	218	333	659	56	60	442	775
10:00 PM	124	13	78	0	40	255	69	0	0	200	269	524	63	67	385	654
11:00 PM	131	14	0	0	27	172	23	0	0	182	205	377	66	70	308	513
12:00 AM	131	14	0	0	0	145	0	0	0	91	91	236	66	70	281	372

Notes:

[1] Hourly parking indices based on ULI - Urban Land Institute "Shared Parking," Second Edition, 2005.

[2] Peak parking rates for all land uses based on County Code.

[3] Weekday parking rates based on the weekday parking demand ratios, as summarized in Table 2-2 of the "Shared Parking" manual.

[4] Meeting and Banquet room Code parking rate based on 1 space per 3 occupants, assuming 1 occupant per 15 square feet.

[5] Hotel Restaurant Code parking rate based on 1 space per 3 occupants, assuming 4,200 square feet of customer area (1 occupant per 15 square feet) and 1,800 square feet of kitchen area (1 occupant per 200 square feet).

[6] To provide a "worst case" analysis, 20,000 square feet analyzed as Medical Office use for weekday parking and Retail use for weekend parking.

[7] Utilizes ULI hourly parking profile for Family Restaurant.

[8] Restaurant Code rate based on 1 space per 3 occupants, assuming 1 occupant per 15 square feet of customer area (55% of the restaurant) or 1 occupant per 200 square feet of kitchen area (45% of restaurant).

[9] Captive adjustment assumes 30% of Hotel Restaurant, Banquet, and Meeting Room occupants generated by Hotel guests.

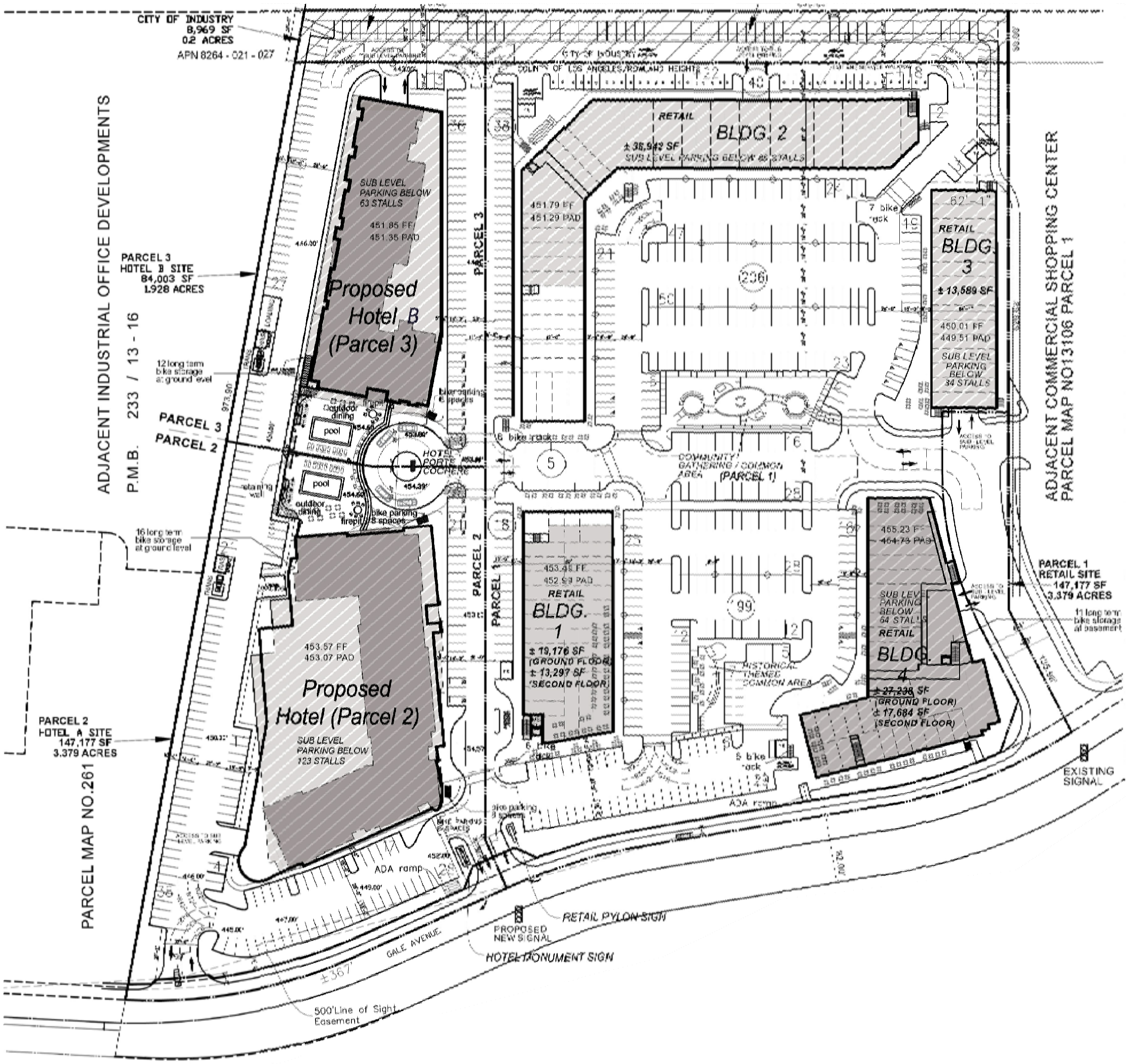
TABLE 3B
WEEKEND SHARED PARKING DEMAND ANALYSIS [1]
ROWLAND HEIGHTS PLAZA AND HOTEL

6-May-15

Land Use	Hotel A - Rooms	Hotel A - Suites	Hotel Banquet Space	Hotel Meeting Space	Hotel Restaurant		Retail	Medical Office / Retail [6]	Office	Restaurant [7]			Hotel B - Rooms	Hotel B - Suites		
Size	**261 Rooms**	**14 Suites**	**10.0 KSF**	**2.0 KSF**	**6.0 KSF**		**63.707 KSF**	**20.0 KSF**	**2.0 KSF**	**40.113 KSF**			**132 Rms**	**70 Suites**		
Peak Pkg Rate [2]	**0.50 /Rm**	**1.00 /Ste**	**[4] /KSF**	**[4] /KSF**	**[5] /KSF**		**4.0 /KSF**	**4.0 /KSF**	**2.5 /KSF**	**[8] /KSF**			**0.50 /Rm**	**1.00 /Ste**		
Weekend Pkg Rate [3]	**0.43 /Rm**	**0.86 /Ste**	**[4] /KSF**	**[4] /KSF**	**[5] /KSF**		**4.0 /KSF**	**4.0 /KSF**	**0.3 /KSF**	**[8] /KSF**			**0.43 /Rm**	**0.86 /Ste**		
Gross Spaces	**113 Spc.**	**12 Spc.**	**222 Spc.**	**44 Spc.**	**96 Spc.**		**255 Spc.**	**80 Spc.**	**1 Spc.**	**520 Spc.**			**57 Spc.**	**60 Spc.**		
Adjusted Gross Spaces [9]	**113 Spc.**	**12 Spc.**	**155 Spc.**	**31 Spc.**	**67 Spc.**		**255 Spc.**	**80 Spc.**	**1 Spc.**	**520 Spc.**			**57 Spc.**	**60 Spc.**		
Time of Day	**Number of Spaces**	**Number of Spaces**	**Number of Spaces**	**Number of Spaces**	**Number of Spaces**	**Subtotal Hotel A Parking Demand**	**Number of Spaces**	**Number of Spaces**	**Number of Spaces**	**Number of Spaces**	**Subtotal Plaza Parking Demand**	**Subtotal Hotel A & Plaza Parking Demand**	**Number of Spaces**	**Number of Spaces**	**Subtotal Hotel A & Hotel B Parking Demand**	**Total Shared Parking Demand**
6:00 AM	107	11	0	0	0	118	3	1	0	52	56	174	54	57	229	285
7:00 AM	102	11	0	0	7	120	13	4	0	130	147	267	51	54	225	372
8:00 AM	90	10	47	16	20	183	26	8	1	234	269	452	46	48	277	546
9:00 AM	79	8	93	31	7	218	77	24	1	364	466	684	40	42	300	766
10:00 AM	68	7	93	31	7	206	128	40	1	468	637	843	34	36	276	913
11:00 AM	68	7	93	31	3	202	166	52	1	468	687	889	34	36	272	959
12:00 PM	62	7	101	31	67	268	204	64	1	520	789	1,057	31	33	332	1,121
1:00 PM	62	7	101	31	67	268	230	72	1	442	745	1,013	31	33	332	1,077
2:00 PM	68	7	101	31	22	229	255	80	1	338	674	903	34	36	299	973
3:00 PM	68	7	101	31	7	214	255	80	0	208	543	757	34	36	284	827
4:00 PM	73	8	101	31	7	220	242	76	0	234	552	772	37	39	296	848
5:00 PM	79	8	155	31	20	293	230	72	0	312	614	907	40	42	375	989
6:00 PM	85	9	155	16	37	302	204	64	0	364	632	934	43	45	390	1,022
7:00 PM	85	9	155	9	40	298	191	60	0	364	615	913	43	45	386	1,001
8:00 PM	90	10	155	9	47	311	166	52	0	338	556	867	46	48	405	961
9:00 PM	96	10	155	3	45	309	128	40	0	156	324	633	48	51	408	732
10:00 PM	107	11	78	0	40	236	89	28	0	130	247	483	54	57	347	594
11:00 PM	113	12	0	0	27	152	38	12	0	78	128	280	57	60	269	397
12:00 AM	113	12	0	0	0	125	0	0	0	52	52	177	57	60	242	294

Notes:

[1] Hourly parking indices based on ULI - Urban Land Institute "Shared Parking," Second Edition, 2005.
[2] Peak parking rates for all land uses based on County Code.
[3] Weekend parking rates reflect relationships between the weekend parking demand ratios and the peak parking demand ratios, as summarized in Table 2-2 of the "Shared Parking" manual.
[4] Meeting and Banquet room Code parking rate based on 1 space per 3 occupants, assuming 1 occupant per 15 square feet.
[5] Hotel Restaurant Code parking rate based on 1 space per 3 occupants, assuming 4,200 square feet of customer area (1 occupant per 15 square feet) and 1,800 square feet of kitchen area (1 occupant per 200 square feet).
[6] To provide a "worst case" analysis, 20,000 square feet analyzed as Medical Office use for weekday parking and Retail use for weekend parking.
[7] Utilizes ULI hourly parking profile for Family Restaurant.
[8] Restaurant Code rate based on 1 space per 3 occupants, assuming 1 occupant per 15 square feet of customer area (55% of the restaurant) or 1 occupant per 200 square feet of kitchen area (45% of restaurant).
[9] Captive adjustment assumes 30% of Hotel Restaurant, Banquet, and Meeting Room occupants generated by Hotel guests.



SOURCE: ARCHITECTS ORANGE

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NOT TO SCALE

FIGURE 1
SITE PLAN

ROWLAND HEIGHTS PLAZA

LINSCOTT, LAW & GREENSPAN, engineers

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Appendix J

Utilities and Service Systems

J-1: SEWER CAPACITY STUDY

SEWER CAPACITY STUDY

FOR

HOTEL/RETAIL SITE
ON GALE AVE.
ROWLAND HEIGHTS, LA COUNTY, CA
TEI PROJECT #3090B
PM 072916
PC 12243AS

Owner:

PARALLAX INVESTMENT CORPORATION
247 DAVENPORT
TORONTO, ON M5R 1J9
CANADA
PHONE: (416) 944-0968

Prepared By:

Thienes Engineering, Inc.
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Date:
Originally Issued: March 2014
Latest Revision: 12/16/15

Submitted To:
Parallax Investment Corporation
Los Angeles County Consolidated Sewer Maintenance District
CNC Engineering (Engineers for the City of Industry)

TABLE OF CONTENTS

1. INTRODUCTION
2. PROJECT DESCRIPTION
3. SEWER PIPE CAPACITY ANALYSIS
4. EXISTING SEWER SYSTEM DESCRIPTION
5. PROPOSED SEWER SYSTEM DESCRIPTION
6. CONCLUSION

LIST OF EXHIBITS

Exhibit 1. Proposed Project Utility Plan

Exhibit 2. Sewer Area Study Map

APPENDICES

Appendix A. Table 1: Sewer Area Study Calculations

Table 2: Site Specific Sewer Calculations

Hydraulic Calculations

Appendix B. Los Angeles County Regional Planning - Zoning Map

City of Industry General Plan – Zoning Map

Estimated Average Daily Sewage Flows for Various Occupancies

Flow Diagram for the Design of Circular Sanitary Sewers - County Standard S-C4

Appendix C. E-2305 - Consolidated County Sewer Maintenance District (S.M.D.) Map

PC-6565 - Sanitary Sewer As-Built

PC-6565R - Sanitary Sewer As-Built

PC-7587 - Sanitary Sewer As-Built

PC-9836 - Sanitary Sewer As-Built

PC-8078 - As-Built

PC-8278 - As-Built

PC-12043 - Sanitary Sewer As-Built

PC-11500 - Sanitary Sewer As-Built

PC-9630 - As-Built

PC-7449 - As-Built

PC-11148 - As-Built

PC-10895 - As-Built

PC-8944 - As-Built

PC-10469 - As-Built

PC-10019 - As-Built

IPC-251 - As-Built

PC-8473 - As-Built

PC-9605 - As-Built

PC-6127 - As-Built

PC-6730 - As-Built

Appendix D. Miscellaneous Supplemental Information

1. INTRODUCTION

The following study analyzes the capacity of sanitary sewer lines from the project site to the main trunk sewer. The boundary of the sewer area study begins just north of Colima Road and continues north and west to the northwest corner of the project site just north of the Union Pacific Railroad where the sewer system joins a Los Angeles County Sanitation District (LACSD) trunk sewer line. The study includes all tributary flow in the sewer system from upstream of the proposed development to downstream of the proposed development the full distance to the LACSD trunk line. The analysis will determine the impact of the proposed development on the existing sewer system.

2. PROJECT DESCRIPTION

The project site is located on the north side of Gale Avenue, south of Railroad Street, west of Nogales Street, and east of Fullerton Road. The majority of the Project Site, 14.06 acres, is within unincorporated Los Angeles County; the remaining 0.79 acres is within the City of Industry municipal boundary. The project site consists of three parcels. The easterly parcel (Parcel 1) will be used for commercial purposes. The westerly parcels (Parcel 2 to the south and Parcel 3 to the north) will be used for two hotels (Hotel "A" on Parcel 2 and Hotel "B" on Parcel 3). Each Parcel and portion of City of Industry vacation used for site purposes is described as follows:

<u>Parcel 1 (Commercial Parcel):</u>
Parcel 1 encompasses 8.75 acres (gross) with 0.57 acres to be dedicated to street right-of-way, due to Gale Avenue widening, yielding a net area of 8.18 acres. An additional 0.57 acres north of Parcel 1, located in the City of Industry, is a portion of vacated Railroad Street that will be used for surface parking and circulation, as well as undergrounding of an existing partially channelized storm drain. The total net site associated with Parcel 1 is 8.75 acres.

Proposed improvements to Parcel 1 include commercial condominium units to accommodate retail and restaurant uses. A total of four buildings will be arrayed around the perimeter of the Parcel, surrounding a central surface parking lot and open space. Buildings 1 and 4 are each two stories. The ground floor of Building 1 is 18,054 square feet (29,518 square feet including 2nd story) while the ground floor of Building 4 is 26,275 square feet (46,124 square feet including 2nd story). Buildings 2 and 3 are one story and encompass 37,430 square feet and 13,041 square feet respectively.

<u>Parcel 2 (Hotel "A" Parcel):</u>
Parcel 2 encompasses 3.38 acres (gross) with 0.16 acres to be dedicated to street right-of-way yielding a net area of 3.22 acres.

The Hotel "A" will be constructed as part of Phase I development. This hotel will be a full service hotel generally intended for business travelers and families. There will be a total of 275 guest rooms with approximately 189,950 square feet, as well as a hotel restaurant, bar, and meeting rooms.

Parcel 3 (Hotel "B" Parcel):
Parcel 3 encompasses 1.93 acres (gross). Similar to Parcel 1, there is additional area north of Parcel 2, in the City of Industry, that will be used for surface parking and circulation, as well as undergrounding of an existing partially channelized storm drain. This area is 0.20 acres yielding a total net site area associated with Parcel 2 of 2.13 acres.

Hotel "B" will be constructed as part of Phase II development. Hotel "B" would be an extended stay hotel, generally intended for travelers and families expecting longer stays, totaling 202 guest rooms and approximately 130,930 square feet.

The entire project site is designated as "M-1.5-BE", Restricted Heavy Manufacturing, by the current County Zoning Map. Surrounding areas to the south and east are similarly zoned and properties with “Commercial” and “I-C Overlay” are located to the immediate west of the site. Property is zoned “Industrial” to the north, across the Union Pacific Railroad Tracks. The overall study areas are as shown on the attached Map in Exhibit 2.

3. SEWER PIPE CAPACITY ANALYSIS

The existing sewer pipes were analyzed using the County of Los Angeles Department of Public Works (LADPW) Sewer Manual S-C4 chart for a maximum design capacity at half full for pipes less than 15” and at three quarters full for pipes 15” and greater. The chart is based on Kutter’s Formula. The cumulative calculated flow for each segment was compared to the sewer capacity at each segment. The equation for the tributary sewer discharge is as follows:

$$Q=ZA$$

Where Q=Sewer discharge (cfs)
Z= Zoning coefficient (cfs/acre)
A=Area (acres)

Refer to Appendix A for Table 1: Sewer Area Study Calculations.

The tributary areas of the sewer study can be found in Exhibit 2. Sewer Study Area Map and Zoning information was obtained from the County of Los Angeles Regional Planning website. The corresponding zoning coefficients were obtained from the County of Los Angeles Department of Public Works. Refer to Appendix B for the zoning map, zoning coefficients Estimated Average Daily Sewage Flows For Various Occupancies and Flow Diagram for the Design of Circular Sanitary Sewers County Standard S-C4.

The Following LADPW as-builts were used in the sewer pipe capacity analysis:

1. E-2305 - Consolidated County Sewer Maintenance District (S.M.D.) Map
2. PC-6565 - As-Built
3. PC-6565R - Sanitary Sewer As-Built
4. PC-7587 - Sanitary Sewer As-Built
5. PC-9836 - Sanitary Sewer As-Built
6. PC-8078 - As-Built
7. PC-8278 - As-Built
8. PC-12043 - Sanitary Sewer As-Built
9. PC-11500 - Sanitary Sewer As-Built
10. PC-9630 - As-Built
11. PC-7449 - As-Built
12. PC-11148 - As-Built
13. PC-10895 - As-Built
14. PC-8944 - As-Built
15. PC-10469 - As-Built
16. PC-10019 - As-Built
17. IPC-251 - As-Built

Refer to Appendix C.

4. EXISTING SEWER SYSTEM DESCRIPTION

The upstream end of the sewer shed begins with an 8" Vitrified Clay Pipe (VCP) just north of the intersection of Colima Road and Nogales Street (MH# 250) and continues north to an 8" VCP just south of the 60 freeway (MH# 264). The 8" VCP continues north crossing the 60 Freeway to the intersection of Gale Avenue and Nogales Street (MH# 269). From MH# 269 the pipe up-sizes to a 10" VCP and continues north to the southerly right of way of the Metrolink Railway (MH#302). From MH# 302, the 10" VCP turns to the west and continues for approximately 1300 feet to MH# 280. From MH# 280, the pipe up-sizes to a 12" VCP and continues west to the northwesterly corner of the proposed project (MH# 281). From MH# 281, the 12" VCP turns north and crosses the Metrolink Railway to MH# 284. From MH# 284, the pipe changes to a 12" Cast Iron Pipe and continues to the north to connection to the 30" Sanitation District No. 21 Outfall Trunk Sewer.

Refer to Exhibit 2 for Sewer Area Study Map of existing sewer lines and flow direction for the study area and the proposed project site.

5. PROPOSED SEWER SYSTEM DESCRIPTION

The project site will discharge into the existing 12" VCP sewer line at the north end of the project at MH# 281. Since the project site is at the very end of the study area and all tributary areas also flow to MH# 281, the sewer study calculations only consider the effect of the proposed project on the 12" sewer line from MH# 281 to MH# 284 to the Trunk Sewer.

Refer to Exhibit 2 for Sewer Area Study Map for discharge to the proposed project site.

6. CONCLUSION

Based on the findings of this report, the existing downstream sewer system has adequate capacity to accommodate the proposed project at the location of confluence (Manhole 281).

Calculations show that a portion of the existing sewer system exceeds 100% (at 50% full), based on depth in pipe. However, the allowable flows for the sewer segment is up to 150% capacity. Locations that exceed the 150% allowable capacity are Manholes 269 and 302. In addition, Manholes 260, 261, and 302 are under pressure at normal depth. Since the proposed project is located downstream of the existing pipe segments that exceed the allowable 150% capacity and the locations where the existing pipe is under pressure flow, the proposed project does not contribute to the existing impacted areas. Mitigation is not warranted for these existing over-capacity locations. See Tables 1 and 2.

The 12" VCP and Cast Iron Pipe from Manholes 281 to 284 to the Trunk sewer connection are at 133.5% capacity. Mitigation is not warranted for the segment because it does not exceed 150% capacity based on LACDPW design criteria.

Prepared by:

Thienes Engineering, Inc

Julianne Frabizio   11/10/2015

Date

Julianne Frabizio, P.E., QSD
RCE 70719 Exp. 06/30/17

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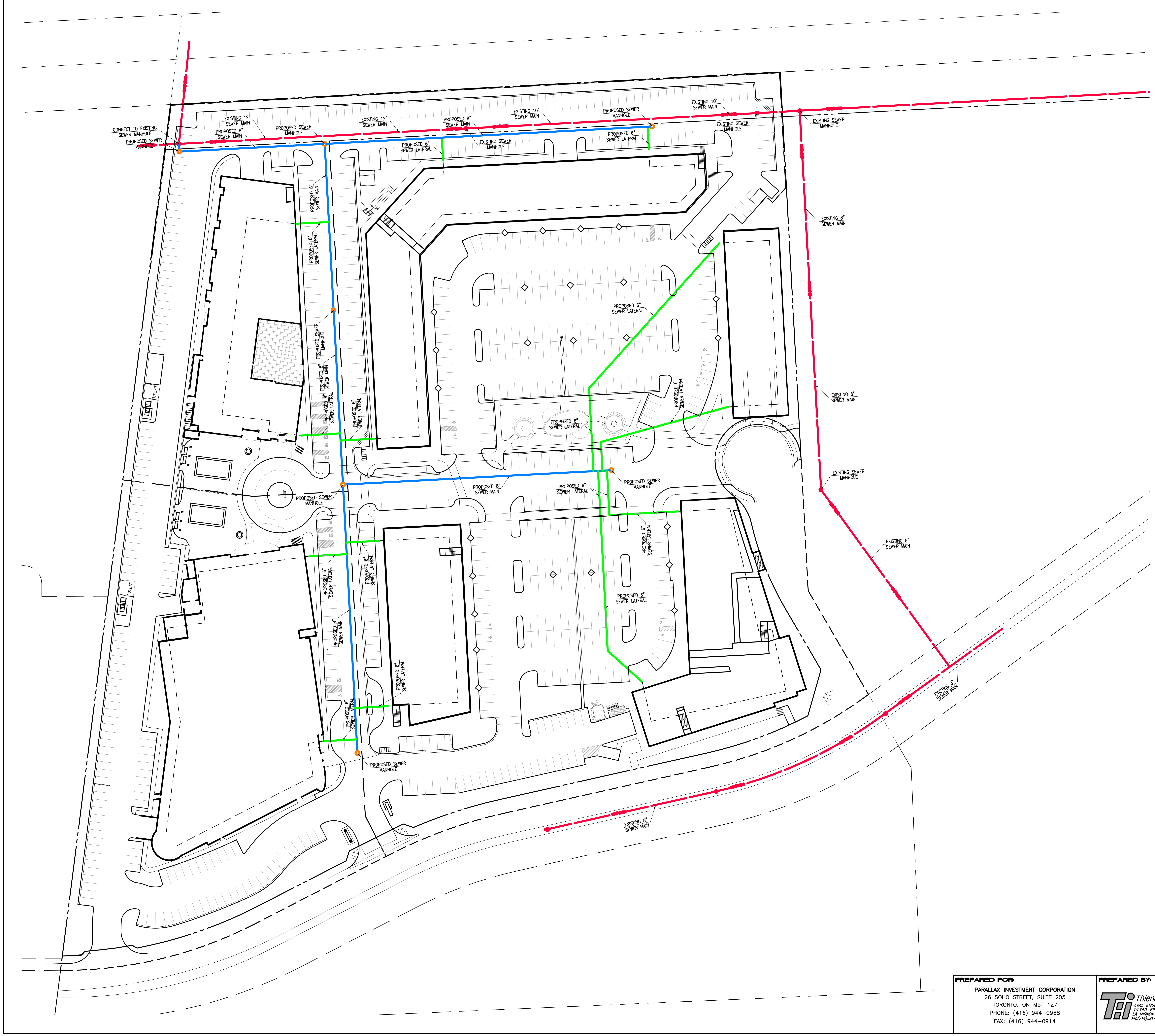
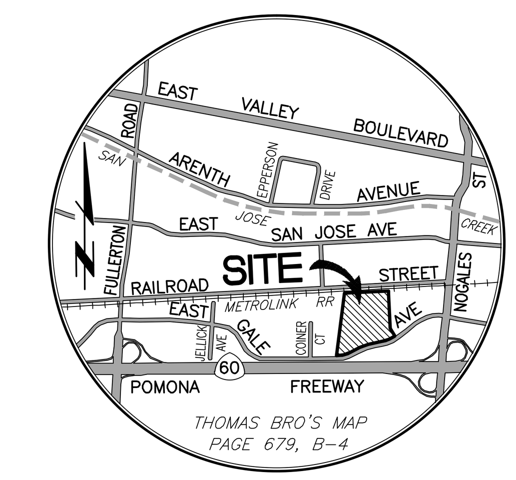
Exhibit 1

Proposed Project Utility Plan





VICINITY MAP
NOT TO SCALE

LEGEND

(blue line)	PROPOSED 8" SEWER MAIN
(green line)	PROPOSED 6" SEWER LATERAL
(red dashed line)	EXISTING SEWER MAIN
(orange circle)	PROPOSED SEWER MANHOLE
(red circle)	EXISTING SEWER MANHOLE

0 20 40 80 120
SCALE: 1"=40'

Last Update: 11/11/15

COUNTY OF LOS ANGELES
PUBLIC WORKS DEPARTMENT

SEWER LINE EXHIBIT
ROWLAND HEIGHTS HOTEL DEVELOPMENT
GALE AVENUE

PREPARED FOR:
PARALLAX INVESTMENT CORPORATION
26 SOHO STREET, SUITE 205
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Designed by ____ Date
Checked by ____ Date
Designed by ____ Date
Checked by ____ Date
Approved by ____ Date ____
Public Works Director ____ R.C.E. XXXXX
Sheet 1 of 1 Sheets

3090/1 OF 1 SHEET

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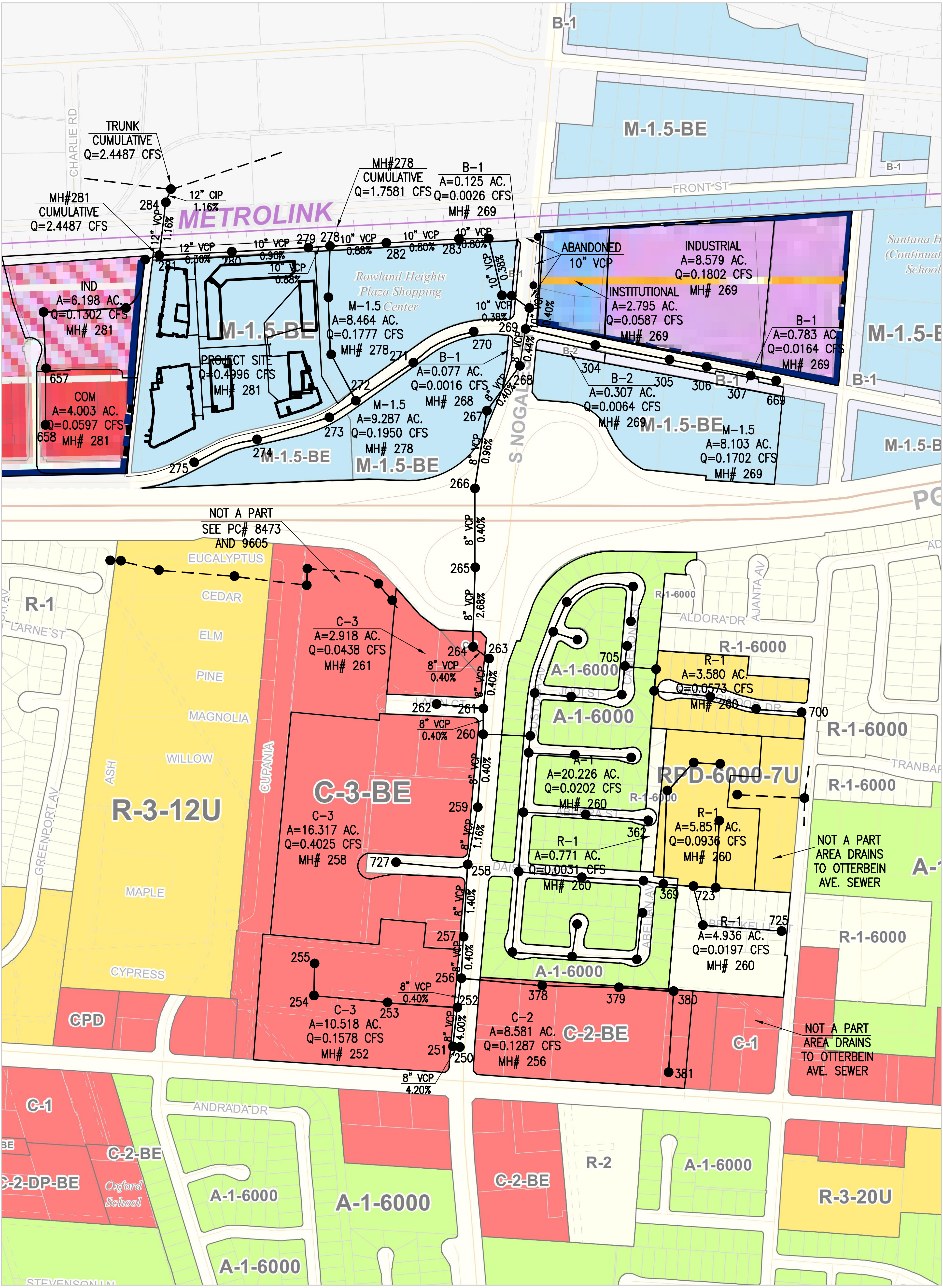
Exhibit 2

Sewer Area Study Map



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Last Update: 12/3/15
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PREPARED UNDER THE SUPERVISION OF:

REINHARD STENZEL DATE
RCE NO. 56155 EXP. 12-31-16

SEWER STUDY AREA

HOTEL/RETAIL SITE
GALE AVE
ROWLAND HEIGHTS, CA

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Appendix A

Table 1: Sewer Area Study Calculations

Table 2: Site Specific Sewer Calculations

Hydraulic Calculations

Kutter's Formula

The standard form of Kutter's Formula is known as the Chézy Formula. Kutter's Formula is widely used in sanitary sewer design and analysis. The roughness component, *C*, is variable and is a function of *R*, *S*, and the channel material. Both *x* and *y* are equal to 1/2.

Equations for U.S. customary units and the S.I. system are shown below:

$$V = C\sqrt{RS} \tag{5.6}$$

The roughness coefficient *C* is related to Manning's *n* through Kutter's formula.

Note: **Kutter's roughness coefficients are the same as Manning's roughness coefficients.**

$$C = \frac{k_1 + \frac{k_2}{S} + \frac{k_3}{n}}{1 + \frac{n}{\sqrt{R}} \cdot \left(k_1 + \frac{k_2}{S}\right)} \tag{5.7}$$

Where	C	=	Chézy's roughness coefficient ($m^{1/2}$/sec., $ft^{1/2}$/sec.)
	S	=	Friction slope (m/m, ft/ft)
	R	=	Hydraulic roughness (unitless)
	n	=	Kutter's roughness (unitless)
	k_1	=	Constant (23.0 SI, 41.65 U.S. customary)
	k_2	=	Constant (0.00155 SI, 0.00281 U.S. customary)
	k_3	=	Constant (1.0 SI, 1.811 U.S. customary)

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Hotel/Retail Site, Gale Avenue, Rowland Heights, CA
Parallax Investment Corp.
TEI Project #3090B, PM 072916, PC 12243AS

Table 1: Sewer Area Study Calculations

Street Name	Segment		Pipe		*Capacity (cfs)		Area (Acres)	Zoning Coeff.	Calculated Flow (cfs)	**Cumulative Calculated Flow (cfs)	Cumulative Depth (ft)	PC or CI Construction Plan #	Comment	% Full		Jurisdiction
	M.H. #	M.H. #	Size (ft.)	Slope (%)	1/2 Full(<15")	3/4 Full(>15")								*** Flow Depth/ (0.5 X Pipe	Cumulative Flow/Capacity	
Commercial on																
Nogales																
Nogales	255	252	0.67	0.004	0.353		10.518	0.015	0.1578	0.1578	0.21	7587				
Dentist (West)	N/A	256	0.67	0.004	0.353		0.092	N/A	0.0046	0.1624	0.21		See Table 2			
Urgent Care (East)	N/A	256	0.67	0.004	0.353		0.023	N/A	0.0012	0.1636	0.21		See Table 2			
Dentist (East)	N/A	256	0.67	0.004	0.353		0.046	N/A	0.0023	0.1659	0.21		See Table 2			
Nogales	381	256	0.67	0.004	0.353		8.512	0.015	0.1277	0.2936	0.29	8078, 8278				
Daisetta St.	727	258	0.67	0.004	0.353		16.225	0.015	0.2434	0.5370	0.41	12046				
Residential Area																
E of Nogales																
Signingwood Dr	700	705	0.67	0.004	0.353		3.580	0.016	0.0573	0.0573	0.12	11500				
R-1 Area	N/A	369	0.67	0.003	0.319		5.851	0.016	0.0936	0.0936	0.17	9630				
R-1 Area	N/A	362	0.67	0.004	0.353		0.771	0.0073	0.0056	0.0056	0.05	7449				LA
Breckelle St	725	723	0.67	0.026	0.905		4.936	0.0073	0.0360	0.0360	0.06	11148				COUNTY
Custoza Ave	N/A	260	0.67	0.004	0.353		20.226	0.0073	0.1476	0.8772	0.44	6565R	*Pipe under pressure*			
Commercial on																
Nogales																
Amer. Engl College	N/A	262	0.67	0.004	0.353		0.077	N/A	0.0032	0.0032	0.05		See Table 2			
Labin Ct.	262	261	0.67	0.004	0.353		2.918	0.015	0.0438	0.9242	0.46	10895	*Pipe under pressure*			
Manufacturing																
E of Nogales																
Buffer Strip	669	269	0.67	0.0148	0.683		0.783	0.021	0.0164	0.0164	0.05	8944				
E Walnut Dr S	669	269	0.67	0.0148	0.683		8.103	0.021	0.1702	0.1866	0.16	8944				
Corner Buffer	N/A	269	0.67	0.0148	0.683		0.307	0.021	0.0064	0.1931	0.16	8944				
ARCO Car Wash	N/A	269	0.67	0.0148	0.683		0.0551	N/A	0.0250	0.2181	0.17		See Table 2			
Industrial	669	269	0.67	0.0148	0.683		8.579	0.021	0.1802	0.1802	0.16	8944		47.8%	26.4%	
Institutional	N/A	269	0.67	0.0148	0.683		2.795	0.021	0.0587	1.3811	0.51	8944	*Existing pipe > 1/2 full*	152.2%	202.3%	
Buffer Strips																
West of Nogales																CITY OF
Buffer Strip	N/A	269	0.67	0.0148	0.683		0.077	0.021	0.0016	1.3827	0.51	10019	*Existing pipe > 1/2 full*	152.2%	202.5%	INDUSTRY
Buffer Strip	N/A	269	0.67	0.004	0.353		0.125	0.021	0.0026	1.3853	0.55	10019	*Pipe under pressure*	164.2%	392.0%	
Manufacturing																
Along Gale Ave																
South of Gale	N/A	272	0.67	0.004	0.353		9.287	0.021	0.1950	0.1950	0.23	10469, 10019				LA
East of Site	272	278	0.67	0.010	0.561		8.464	0.021	0.1777	0.3728	0.25	10019				COUNTY
Confluence at 278	N/A	278	0.83	0.010	1.028					1.7581	0.57		Pipe diameter change	136.8%	171.0%	
Areas W of Site																
IQ Laser Vision	N/A	658	0.67	0.004	0.353		0.023	N/A	0.0012	0.0012	0.05		See Table 2	14.9%	0.3%	
Commercial	658	657	0.67	0.004	0.353		3.98	0.015	0.0597	0.0609	0.013	251		3.9%	17.2%	
Industrial/Commercia	657	281	0.67	0.004	0.353		6.198	0.021	0.1302	0.1910	0.23	251		68.7%	54.0%	CITY OF
																INDUSTRY
Project Site																
	N/A	281	1.0	0.0116	1.834				0.4996	**2.4487**	0.58			116.0%	133.5%	
							Subtotal Check		**2.4487**							
	281	284	1.0	0.0116	1.834		N/A	N/A	2.4487	2.4487	0.58	6565		116.0%	133.5%	
All Flows to Trunk	284	TRUNK	1.0	0.0116	**1.834**		N/A	N/A	2.4487	2.4487	**0.58**	6565		116.0%	133.5%	

* Calculated using Kutter's Formula with n=0.013 (as in S-C4 graph in PC Procedural Manual)

** Based on current land use and coefficients per LA County, (Attach supporting calculations)

*** For pipes > 15" % Full should be calculated by taking the flow depth divided by 0.75 times the pipe diameter

Note:

"Institutional" Zone type for the City of Industry is currently under construction. See Appendix D, Nogales Street Grade Separation and Roadway Widening Project for details.
Technically, this area will not contribute any flows to the existing sewer system. However, in this study, the Industrial zone type has been used a a worse case scenario.

Hotel/Retail Site, Gale Avenue, Rowland Heights, CA
Parallax Investment Corp.
TEI Project #3090B, PM 072916, PC 12243AS

Table 2: Site Specific Sewer Calculations

Business Name	Parameters	Notes	Average Daily Flow (gal/day)	Peak Factor	Peak Flow (gal/day)	Peak Flow (cfs)
Areas W of Site						
IQ Laser Vision	1000 sq-ft	300 gal/1000 sq ft	300	2.5	750	0.0012
Commercial on						
Nogales						
Dentist (West)	4000 sq-ft	300 gal/1000 sq ft	1200	2.5	3000	0.0046
Urgent Care (East)	1000 sq-ft	300 gal/1000 sq ft	300	2.5	750	0.0012
Dentist (East)	2000 sq-ft	300 gal/1000 sq ft	600	2.5	1500	0.0023
Labin Ct.						
Amer. Engl College	42 students	20 gal/student	840	2.5	2100	0.0032
Manufacturing						
E of Nogales						
ARCO Car Wash	2400 sq-ft	*	16438	N/A	16438	0.025

Los Angeles County Sanitation District. Since this site does not have an industrial wastewater permit, a worst case scenario assumption is made that the site discharges 6 MG per year.

Julianne Frabizio

From: Kimberley Wong <kimberley@aec.edu>
Sent: Thursday, November 05, 2015 10:40 AM
To: Julianne Frabizio
Subject: Re: Number of Students/Staff at your Educational Facility

Hi Julianne,

Thank you for your email. On average, we have about 35 students and 7 staff members at our facility. Please let me know if you need anything else.

Sincerely,

Kimberley Wong

On Thu, Nov 5, 2015 at 10:18 AM, Julianne Frabizio <julianne@thieneseng.com> wrote:

> Hi Kimberley,
>
> I spoke with you a couple of days ago regarding the number of students and staff you have at your facility. The City of Rowland Heights requires that I get a head count for your educational facility for my sewer study. An email will suffice, stating an average number of students and staff at your facility.
>
> Thank you for your help.
>
> **Julianne Frabizio, PE, QSD**
>
> Water Resource Engineer
>
> **THIENES ENGINEERING, INC.**
> 14349 Firestone Blvd. | La Mirada, California | 90638
> P: 714.521.4811 ext: 231 F: 714.521.4173
>
> julianne@thieneseng.com

--
Kimberley Wong
Center Director
American English College - Rowland Heights
kimberley@aec.edu I 626-820-9138
skype: kimberley_aec

Hotel/Retail Site, Gale Avenue, Rowland Heights, CA
Parallax Investment Corp.
TEI Project #3090B, PM 072916, PC 12243AS

BUSINESS NAME	OCCUPANCY	QUANTITY		FLOW (GPD)	UNIT OF MEASURE	AVG. FLOWRATE (GPM)	AVG. FLOWRATE (CFS)	PEAK FLOWRATE (CFS)
Proposed Hotel A	Hotel	275	Rooms	150	/Room	28.65	0.0638	0.160
Restaurant/Bar	Restaurant	94	Seats[1]	50	/Seat	3.26	0.0073	0.018
Meeting Rooms	Auditoriums, churches, etc.	266	Seats[1]	5	/Seat	0.92	0.0021	0.005
Proposed Hotel B	Hotel	202	Rooms	150	/Room	21.04	0.0469	0.117
Proposed Retail:								
Building 1:								
Restaurant/Food Service	Restaurant	251	Seats[1]	50	/Seat	8.73	0.0195	0.049
Retail	Commercial Shops & Stores	21,739	SF	100	/1000 SF	1.51	0.0034	0.008
Building 2:								
Restaurant/Food Service	Restaurant	269	Seats[1]	50	/Seat	9.34	0.0208	0.052
Retail	Commercial Shops & Stores	8,726	SF	100	/1000 SF	0.61	0.0014	0.003
Building 3								
Restaurant/Food Service	Restaurant	99	Seats[1]	50	/Seat	3.45	0.0077	0.019
Retail	Commercial Shops & Stores	9,512	SF	100	/1000 SF	0.66	0.0015	0.004
Building 4:								
Restaurant/Food Service	Restaurant	305	Seats[1]	50	/Seat	10.58	0.0236	0.059
Office	Office Building	2,000	SF	200	/1000 SF	0.28	0.0006	0.002
Retail	Commercial Shops & Stores	9,512	SF	100	/1000 SF	0.66	0.0015	0.004
						89.69	0.1998	**0.4996**

Note:
(1) Number of seats based on Parking Requirements of County of Los Angeles based on Floor Area (Net)

```
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                             LA MIRADA CA 90638
                   PH: (714) 521-4811 FAX: (714) 521-4173

----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:30  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* MH 255 TO MH 252                                                         *
*                                                                          *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =         0.16
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =      0.18
    CRITICAL FLOW AREA(SQUARE FEET) =      0.077
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.596
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =             0.99
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      2.043
    CRITICAL FLOW VELOCITY HEAD(FEET) =             0.06
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =       0.13
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =             0.25
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =        0.21
    FLOW AREA(SQUARE FEET) =        0.09
    FLOW TOP-WIDTH(FEET) =     0.618
    FLOW PRESSURE + MOMENTUM(POUNDS) =             1.02
    FLOW VELOCITY(FEET/SEC.) =          1.724
    FLOW VELOCITY HEAD(FEET) =          0.046
    HYDRAULIC DEPTH(FEET) =       0.15
    FROUDE NUMBER =      0.789
    SPECIFIC ENERGY(FEET) =           0.25
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:31  11/ 9/2015
============================================================================


 ************************* DESCRIPTION OF STUDY **************************
 * MH 256                                                                  *
 *   Dentist                                                               *
 *                                                                         *
 ***************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =         0.16
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =      0.18
    CRITICAL FLOW AREA(SQUARE FEET) =      0.079
    CRITICAL FLOW TOP-WIDTH(FEET) =    0.598
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =             1.03
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      2.060
    CRITICAL FLOW VELOCITY HEAD(FEET) =            0.07
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.13
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =            0.25
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =       0.21
    FLOW AREA(SQUARE FEET) =       0.09
    FLOW TOP-WIDTH(FEET) =     0.620
    FLOW PRESSURE + MOMENTUM(POUNDS) =           1.05
    FLOW VELOCITY(FEET/SEC.) =          1.738
    FLOW VELOCITY HEAD(FEET) =          0.047
    HYDRAULIC DEPTH(FEET) =      0.15
    FROUDE NUMBER =     0.789
    SPECIFIC ENERGY(FEET) =            0.26
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:31  11/ 9/2015
============================================================================


 ************************* DESCRIPTION OF STUDY **************************
* MH 256                                                                   *
*   Urgent Care                                                            *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =         0.16
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.19
    CRITICAL FLOW AREA(SQUARE FEET) =      0.079
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.599
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =            1.04
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      2.064
    CRITICAL FLOW VELOCITY HEAD(FEET) =             0.07
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.13
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =            0.25
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =        0.21
    FLOW AREA(SQUARE FEET) =       0.09
    FLOW TOP-WIDTH(FEET) =      0.621
    FLOW PRESSURE + MOMENTUM(POUNDS) =             1.06
    FLOW VELOCITY(FEET/SEC.) =            1.742
    FLOW VELOCITY HEAD(FEET) =            0.047
    HYDRAULIC DEPTH(FEET) =       0.15
    FROUDE NUMBER =      0.789
    SPECIFIC ENERGY(FEET) =             0.26
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:35  11/ 9/2015
============================================================================


 ************************* DESCRIPTION OF STUDY *************************
* MH 256                                                                  *
*   Dentist                                                               *
*                                                                         *
 ************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =         0.17
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =      0.19
    CRITICAL FLOW AREA(SQUARE FEET) =     0.080
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.600
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =           1.05
    CRITICAL FLOW VELOCITY(FEET/SEC.) =     2.072
    CRITICAL FLOW VELOCITY HEAD(FEET) =           0.07
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     0.13
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =          0.25
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =       0.21
    FLOW AREA(SQUARE FEET) =       0.09
    FLOW TOP-WIDTH(FEET) =     0.622
    FLOW PRESSURE + MOMENTUM(POUNDS) =           1.08
    FLOW VELOCITY(FEET/SEC.) =           1.749
    FLOW VELOCITY HEAD(FEET) =           0.047
    HYDRAULIC DEPTH(FEET) =      0.15
    FROUDE NUMBER =     0.789
    SPECIFIC ENERGY(FEET) =           0.26
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:33  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* MH 381 TO MH 256                                                         *
*                                                                          *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =    0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =          0.29
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.25
    CRITICAL FLOW AREA(SQUARE FEET) =      0.120
    CRITICAL FLOW TOP-WIDTH(FEET) =    0.648
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =            2.17
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      2.443
    CRITICAL FLOW VELOCITY HEAD(FEET) =            0.09
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.19
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =           0.34
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =        0.29
    FLOW AREA(SQUARE FEET) =        0.14
    FLOW TOP-WIDTH(FEET) =      0.663
    FLOW PRESSURE + MOMENTUM(POUNDS) =            2.24
    FLOW VELOCITY(FEET/SEC.) =            2.045
    FLOW VELOCITY HEAD(FEET) =            0.065
    HYDRAULIC DEPTH(FEET) =       0.22
    FROUDE NUMBER =     0.774
    SPECIFIC ENERGY(FEET) =             0.35
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:35  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* MH 727 TO MH 258                                                         *
*                                                                          *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =    0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =          0.54
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.34
    CRITICAL FLOW AREA(SQUARE FEET) =     0.182
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.670
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =           4.73
    CRITICAL FLOW VELOCITY(FEET/SEC.) =     2.955
    CRITICAL FLOW VELOCITY HEAD(FEET) =            0.14
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.27
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =          0.48
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =        0.41
    FLOW AREA(SQUARE FEET) =        0.23
    FLOW TOP-WIDTH(FEET) =      0.653
    FLOW PRESSURE + MOMENTUM(POUNDS) =           4.98
    FLOW VELOCITY(FEET/SEC.) =          2.372
    FLOW VELOCITY HEAD(FEET) =          0.087
    HYDRAULIC DEPTH(FEET) =       0.35
    FROUDE NUMBER =      0.710
    SPECIFIC ENERGY(FEET) =           0.50
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:36  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
 * MH 700 TO MH 705                                                        *
 *                                                                         *
 *                                                                         *
 ***************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =         0.06
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.11
    CRITICAL FLOW AREA(SQUARE FEET) =      0.037
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.493
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =            0.28
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      1.552
    CRITICAL FLOW VELOCITY HEAD(FEET) =             0.04
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.07
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =           0.15
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =       0.12
    FLOW AREA(SQUARE FEET) =       0.04
    FLOW TOP-WIDTH(FEET) =      0.519
    FLOW PRESSURE + MOMENTUM(POUNDS) =           0.29
    FLOW VELOCITY(FEET/SEC.) =           1.286
    FLOW VELOCITY HEAD(FEET) =           0.026
    HYDRAULIC DEPTH(FEET) =       0.09
    FROUDE NUMBER =     0.773
    SPECIFIC ENERGY(FEET) =           0.15
============================================================================
```

```
****************************************************************************
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                          LA MIRADA CA 90638
                 PH: (714) 521-4811 FAX: (714) 521-4173

----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:36  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* MH 369                                                                   *
*                                                                          *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =    0.670
    PIPE SLOPE(FEET/FEET) =  0.0030
    PIPEFLOW(CFS) =          0.09
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.14
    CRITICAL FLOW AREA(SQUARE FEET) =      0.053
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.543
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =            0.51
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      1.770
    CRITICAL FLOW VELOCITY HEAD(FEET) =            0.05
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.10
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =            0.19
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =       0.17
    FLOW AREA(SQUARE FEET) =       0.07
    FLOW TOP-WIDTH(FEET) =     0.582
    FLOW PRESSURE + MOMENTUM(POUNDS) =            0.55
    FLOW VELOCITY(FEET/SEC.) =          1.340
    FLOW VELOCITY HEAD(FEET) =          0.028
    HYDRAULIC DEPTH(FEET) =      0.12
    FROUDE NUMBER =      0.682
    SPECIFIC ENERGY(FEET) =            0.20
============================================================================
```

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----------------------------------------------------------------------------
 TIME/DATE OF STUDY: 11:37  11/ 9/2015
============================================================================


 ************************* DESCRIPTION OF STUDY **************************
* MH 362                                                                   *
*                                                                          *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
   PIPE DIAMETER(FEET) =   0.670
   PIPE SLOPE(FEET/FEET) =  0.0040
   PIPEFLOW(CFS) =         0.01
   MANNINGS FRICTION FACTOR = 0.013000
============================================================================
   CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
   CRITICAL DEPTH(FEET) =       0.04
   CRITICAL FLOW AREA(SQUARE FEET) =      0.010
   CRITICAL FLOW TOP-WIDTH(FEET) =   0.335
   CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =            0.03
   CRITICAL FLOW VELOCITY(FEET/SEC.) =     0.987
   CRITICAL FLOW VELOCITY HEAD(FEET) =            0.02
   CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.03
   CRITICAL FLOW SPECIFIC ENERGY(FEET) =            0.06
============================================================================
   NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
   NORMAL DEPTH(FEET) =      0.05
   FLOW AREA(SQUARE FEET) =       0.01
   FLOW TOP-WIDTH(FEET) =     0.363
   FLOW PRESSURE + MOMENTUM(POUNDS) =            0.03
   FLOW VELOCITY(FEET/SEC.) =          0.762
   FLOW VELOCITY HEAD(FEET) =          0.009
   HYDRAULIC DEPTH(FEET) =      0.04
   FROUDE NUMBER =     0.706
   SPECIFIC ENERGY(FEET) =          0.06
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:38  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* MH 725 TO MH 723                                                         *
*                                                                          *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0260
    PIPEFLOW(CFS) =         0.04
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.09
    CRITICAL FLOW AREA(SQUARE FEET) =      0.026
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.447
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =            0.15
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      1.374
    CRITICAL FLOW VELOCITY HEAD(FEET) =            0.03
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.06
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =           0.11
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =       0.06
    FLOW AREA(SQUARE FEET) =       0.02
    FLOW TOP-WIDTH(FEET) =     0.391
    FLOW PRESSURE + MOMENTUM(POUNDS) =           0.18
    FLOW VELOCITY(FEET/SEC.) =           2.157
    FLOW VELOCITY HEAD(FEET) =           0.072
    HYDRAULIC DEPTH(FEET) =      0.04
    FROUDE NUMBER =      1.839
    SPECIFIC ENERGY(FEET) =           0.14
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:38  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* MH 260                                                                    *
*                                                                           *
*                                                                           *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =    0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =          0.88
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.44
    CRITICAL FLOW AREA(SQUARE FEET) =      0.247
    CRITICAL FLOW TOP-WIDTH(FEET) =    0.634
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =            9.02
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      3.545
    CRITICAL FLOW VELOCITY HEAD(FEET) =             0.20
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =       0.39
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =            0.64
    ==>NORMAL PIPEFLOW IS PRESSURE FLOW
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:39  11/ 9/2015
============================================================================


 ************************* DESCRIPTION OF STUDY *************************
* AMERICAN ENGLISH COLLEGE                                                 *
*                                                                          *
* MH 262                                                                   *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =    0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =          0.01
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.04
    CRITICAL FLOW AREA(SQUARE FEET) =      0.010
    CRITICAL FLOW TOP-WIDTH(FEET) =    0.335
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =              0.03
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      0.987
    CRITICAL FLOW VELOCITY HEAD(FEET) =             0.02
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.03
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =           0.06
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =       0.05
    FLOW AREA(SQUARE FEET) =       0.01
    FLOW TOP-WIDTH(FEET) =     0.363
    FLOW PRESSURE + MOMENTUM(POUNDS) =             0.03
    FLOW VELOCITY(FEET/SEC.) =           0.762
    FLOW VELOCITY HEAD(FEET) =           0.009
    HYDRAULIC DEPTH(FEET) =        0.04
    FROUDE NUMBER =      0.706
    SPECIFIC ENERGY(FEET) =            0.06
============================================================================
```

```
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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:40  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
 * MH 262 TO MH 261                                                        *
 *                                                                         *
 *                                                                         *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =          0.92
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =      0.46
    CRITICAL FLOW AREA(SQUARE FEET) =      0.255
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.625
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =             6.84
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      3.624
    CRITICAL FLOW VELOCITY HEAD(FEET) =             0.20
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.41
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =             0.66
    ==>NORMAL PIPEFLOW IS PRESSURE FLOW
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:41  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* MH 669 TO MH 269                                                         *
*                                                                          *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0148
    PIPEFLOW(CFS) =          0.02
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =      0.06
    CRITICAL FLOW AREA(SQUARE FEET) =      0.015
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.375
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =           0.06
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      1.121
    CRITICAL FLOW VELOCITY HEAD(FEET) =             0.02
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.04
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =             0.08
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =      0.05
    FLOW AREA(SQUARE FEET) =       0.01
    FLOW TOP-WIDTH(FEET) =     0.350
    FLOW PRESSURE + MOMENTUM(POUNDS) =          0.06
    FLOW VELOCITY(FEET/SEC.) =          1.397
    FLOW VELOCITY HEAD(FEET) =          0.030
    HYDRAULIC DEPTH(FEET) =      0.03
    FROUDE NUMBER =      1.345
    SPECIFIC ENERGY(FEET) =            0.08
============================================================================
```

1

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:41  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* MH 669 TO MH 269                                                         *
*                                                                          *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0148
    PIPEFLOW(CFS) =         0.19
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.20
    CRITICAL FLOW AREA(SQUARE FEET) =      0.087
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.611
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =           1.22
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      2.142
    CRITICAL FLOW VELOCITY HEAD(FEET) =            0.07
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.14
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =            0.27
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =       0.16
    FLOW AREA(SQUARE FEET) =       0.06
    FLOW TOP-WIDTH(FEET) =     0.571
    FLOW PRESSURE + MOMENTUM(POUNDS) =           1.31
    FLOW VELOCITY(FEET/SEC.) =           2.885
    FLOW VELOCITY HEAD(FEET) =           0.129
    HYDRAULIC DEPTH(FEET) =      0.11
    FROUDE NUMBER =     1.511
    SPECIFIC ENERGY(FEET) =           0.29
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:42  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
 * MH 269                                                                 *
 *                                                                        *
 *                                                                        *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0148
    PIPEFLOW(CFS) =         0.19
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =      0.20
    CRITICAL FLOW AREA(SQUARE FEET) =     0.089
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.615
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =           1.28
    CRITICAL FLOW VELOCITY(FEET/SEC.) =     2.163
    CRITICAL FLOW VELOCITY HEAD(FEET) =           0.07
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     0.15
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =           0.27
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =        0.16
    FLOW AREA(SQUARE FEET) =        0.07
    FLOW TOP-WIDTH(FEET) =     0.575
    FLOW PRESSURE + MOMENTUM(POUNDS) =          1.37
    FLOW VELOCITY(FEET/SEC.) =          2.914
    FLOW VELOCITY HEAD(FEET) =          0.132
    HYDRAULIC DEPTH(FEET) =     0.12
    FROUDE NUMBER =     1.512
    SPECIFIC ENERGY(FEET) =           0.29
============================================================================
```

```
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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:47  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* ARCO CAR WASH                                                            *
* MH 269                                                                   *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0148
    PIPEFLOW(CFS) =         0.22
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.21
    CRITICAL FLOW AREA(SQUARE FEET) =      0.097
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.625
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =           1.49
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      2.240
    CRITICAL FLOW VELOCITY HEAD(FEET) =            0.08
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.16
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =            0.29
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =      0.17
    FLOW AREA(SQUARE FEET) =      0.07
    FLOW TOP-WIDTH(FEET) =     0.587
    FLOW PRESSURE + MOMENTUM(POUNDS) =          1.60
    FLOW VELOCITY(FEET/SEC.) =          3.018
    FLOW VELOCITY HEAD(FEET) =          0.141
    HYDRAULIC DEPTH(FEET) =      0.12
    FROUDE NUMBER =     1.515
    SPECIFIC ENERGY(FEET) =           0.31
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:48  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* MH 669 TO MH 269                                                         *
*                                                                          *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0148
    PIPEFLOW(CFS) =         0.18
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.19
    CRITICAL FLOW AREA(SQUARE FEET) =     0.085
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.608
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =           1.17
    CRITICAL FLOW VELOCITY(FEET/SEC.) =     2.121
    CRITICAL FLOW VELOCITY HEAD(FEET) =           0.07
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.14
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =          0.26
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =        0.16
    FLOW AREA(SQUARE FEET) =        0.06
    FLOW TOP-WIDTH(FEET) =      0.568
    FLOW PRESSURE + MOMENTUM(POUNDS) =           1.26
    FLOW VELOCITY(FEET/SEC.) =           2.856
    FLOW VELOCITY HEAD(FEET) =           0.127
    HYDRAULIC DEPTH(FEET) =       0.11
    FROUDE NUMBER =      1.510
    SPECIFIC ENERGY(FEET) =           0.28
============================================================================
```

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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:44  11/ 9/2015
============================================================================


 ************************* DESCRIPTION OF STUDY **************************
* MH 269                                                                   *
*                                                                          *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0148
    PIPEFLOW(CFS) =         1.38
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.55
    CRITICAL FLOW AREA(SQUARE FEET) =     0.311
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.509
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =           13.15
    CRITICAL FLOW VELOCITY(FEET/SEC.) =     4.438
    CRITICAL FLOW VELOCITY HEAD(FEET) =            0.31
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.61
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =           0.86
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =        0.51
    FLOW AREA(SQUARE FEET) =        0.29
    FLOW TOP-WIDTH(FEET) =     0.572
    FLOW PRESSURE + MOMENTUM(POUNDS) =            14.02
    FLOW VELOCITY(FEET/SEC.) =          4.798
    FLOW VELOCITY HEAD(FEET) =          0.358
    HYDRAULIC DEPTH(FEET) =      0.50
    FROUDE NUMBER =     1.192
    SPECIFIC ENERGY(FEET) =           0.87
============================================================================
```

```
****************************************************************************
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                          LA MIRADA CA 90638
                PH: (714) 521-4811 FAX: (714) 521-4173

----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:49  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
 * BUFFER STRIP                                                             *
 * MH 269                                                                   *
 *                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =    0.670
    PIPE SLOPE(FEET/FEET) =  0.0148
    PIPEFLOW(CFS) =          1.38
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.55
    CRITICAL FLOW AREA(SQUARE FEET) =      0.311
    CRITICAL FLOW TOP-WIDTH(FEET) =    0.508
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =          13.17
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      4.441
    CRITICAL FLOW VELOCITY HEAD(FEET) =           0.31
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.61
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =          0.86
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =        0.51
    FLOW AREA(SQUARE FEET) =        0.29
    FLOW TOP-WIDTH(FEET) =      0.571
    FLOW PRESSURE + MOMENTUM(POUNDS) =          14.04
    FLOW VELOCITY(FEET/SEC.) =          4.799
    FLOW VELOCITY HEAD(FEET) =          0.358
    HYDRAULIC DEPTH(FEET) =      0.50
    FROUDE NUMBER =      1.190
    SPECIFIC ENERGY(FEET) =           0.87
============================================================================
```

```
****************************************************************************
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                   LA MIRADA CA 90638
          PH: (714) 521-4811 FAX: (714) 521-4173

----------------------------------------------------------------------------
 TIME/DATE OF STUDY: 11:49  11/ 9/2015
============================================================================


 ************************* DESCRIPTION OF STUDY **************************
* BUFFER STRIP                                                             *
* MH 302                                                                   *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
   PIPE DIAMETER(FEET) =   0.670
   PIPE SLOPE(FEET/FEET) =  0.0040
   PIPEFLOW(CFS) =         1.39
   MANNINGS FRICTION FACTOR = 0.013000
============================================================================
   CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
   CRITICAL DEPTH(FEET) =       0.55
   CRITICAL FLOW AREA(SQUARE FEET) =     0.312
   CRITICAL FLOW TOP-WIDTH(FEET) =   0.508
   CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =          13.21
   CRITICAL FLOW VELOCITY(FEET/SEC.) =     4.446
   CRITICAL FLOW VELOCITY HEAD(FEET) =           0.31
   CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.61
   CRITICAL FLOW SPECIFIC ENERGY(FEET) =           0.86
   ==>NORMAL PIPEFLOW IS PRESSURE FLOW
============================================================================
```

```
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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:50  11/ 9/2015
============================================================================


 ************************* DESCRIPTION OF STUDY **************************
* MH 272                                                                   *
*                                                                          *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =         0.19
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.20
    CRITICAL FLOW AREA(SQUARE FEET) =     0.090
    CRITICAL FLOW TOP-WIDTH(FEET) =    0.615
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =            1.29
    CRITICAL FLOW VELOCITY(FEET/SEC.) =     2.169
    CRITICAL FLOW VELOCITY HEAD(FEET) =           0.07
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.15
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =           0.28
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =       0.23
    FLOW AREA(SQUARE FEET) =       0.11
    FLOW TOP-WIDTH(FEET) =     0.636
    FLOW PRESSURE + MOMENTUM(POUNDS) =            1.33
    FLOW VELOCITY(FEET/SEC.) =          1.830
    FLOW VELOCITY HEAD(FEET) =          0.052
    HYDRAULIC DEPTH(FEET) =      0.17
    FROUDE NUMBER =     0.787
    SPECIFIC ENERGY(FEET) =            0.28
============================================================================
```

```
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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:51  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
 * MH 272 TO MH 278                                                         *
 *                                                                          *
 *                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0100
    PIPEFLOW(CFS) =         0.37
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.28
    CRITICAL FLOW AREA(SQUARE FEET) =      0.142
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.662
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =            2.95
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      2.627
    CRITICAL FLOW VELOCITY HEAD(FEET) =            0.11
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.21
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =            0.39
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =        0.25
    FLOW AREA(SQUARE FEET) =        0.12
    FLOW TOP-WIDTH(FEET) =     0.650
    FLOW PRESSURE + MOMENTUM(POUNDS) =           3.01
    FLOW VELOCITY(FEET/SEC.) =          3.048
    FLOW VELOCITY HEAD(FEET) =          0.144
    HYDRAULIC DEPTH(FEET) =      0.19
    FROUDE NUMBER =     1.238
    SPECIFIC ENERGY(FEET) =           0.40
============================================================================
```

1

```
****************************************************************************
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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:52  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* CONFLUENCE AT MH 278                                                      *
*                                                                           *
*                                                                           *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =    0.830
    PIPE SLOPE(FEET/FEET) =  0.0100
    PIPEFLOW(CFS) =         1.76
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.60
    CRITICAL FLOW AREA(SQUARE FEET) =     0.416
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.747
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =          21.25
    CRITICAL FLOW VELOCITY(FEET/SEC.) =     4.231
    CRITICAL FLOW VELOCITY HEAD(FEET) =           0.28
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.56
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =           0.87
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =        0.57
    FLOW AREA(SQUARE FEET) =        0.39
    FLOW TOP-WIDTH(FEET) =     0.772
    FLOW PRESSURE + MOMENTUM(POUNDS) =         21.34
    FLOW VELOCITY(FEET/SEC.) =          4.462
    FLOW VELOCITY HEAD(FEET) =          0.309
    HYDRAULIC DEPTH(FEET) =       0.51
    FROUDE NUMBER =      1.101
    SPECIFIC ENERGY(FEET) =          0.88
============================================================================
```

```
****************************************************************************
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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:53  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* IQ LASER VISION                                                          *
* MH 658                                                                   *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =    0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =         0.01
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.04
    CRITICAL FLOW AREA(SQUARE FEET) =     0.010
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.335
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =            0.03
    CRITICAL FLOW VELOCITY(FEET/SEC.) =     0.987
    CRITICAL FLOW VELOCITY HEAD(FEET) =           0.02
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.03
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =           0.06
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =       0.05
    FLOW AREA(SQUARE FEET) =       0.01
    FLOW TOP-WIDTH(FEET) =     0.363
    FLOW PRESSURE + MOMENTUM(POUNDS) =           0.03
    FLOW VELOCITY(FEET/SEC.) =          0.762
    FLOW VELOCITY HEAD(FEET) =          0.009
    HYDRAULIC DEPTH(FEET) =      0.04
    FROUDE NUMBER =      0.706
    SPECIFIC ENERGY(FEET) =           0.06
============================================================================
```

```
**************************************************************************
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--------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:53  11/ 9/2015
==========================================================================


 ************************** DESCRIPTION OF STUDY **************************
* MH 658 TO MH 657                                                         *
*                                                                          *
*                                                                          *
 **************************************************************************

**************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
--------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =         0.06
    MANNINGS FRICTION FACTOR = 0.013000
==========================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
--------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.11
    CRITICAL FLOW AREA(SQUARE FEET) =      0.039
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.499
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =             0.30
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      1.578
    CRITICAL FLOW VELOCITY HEAD(FEET) =             0.04
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.08
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =           0.15
==========================================================================
    NORMAL-DEPTH FLOW INFORMATION:
--------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =      0.13
    FLOW AREA(SQUARE FEET) =       0.05
    FLOW TOP-WIDTH(FEET) =     0.525
    FLOW PRESSURE + MOMENTUM(POUNDS) =            0.31
    FLOW VELOCITY(FEET/SEC.) =          1.309
    FLOW VELOCITY HEAD(FEET) =          0.027
    HYDRAULIC DEPTH(FEET) =       0.09
    FROUDE NUMBER =     0.775
    SPECIFIC ENERGY(FEET) =           0.15
==========================================================================
```

```
****************************************************************************
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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:54  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* MH 657 TO MH 281                                                         *
*                                                                          *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   0.670
    PIPE SLOPE(FEET/FEET) =  0.0040
    PIPEFLOW(CFS) =         0.19
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.20
    CRITICAL FLOW AREA(SQUARE FEET) =      0.089
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.614
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =            1.26
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      2.156
    CRITICAL FLOW VELOCITY HEAD(FEET) =            0.07
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.14
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =            0.27
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =        0.23
    FLOW AREA(SQUARE FEET) =        0.10
    FLOW TOP-WIDTH(FEET) =      0.634
    FLOW PRESSURE + MOMENTUM(POUNDS) =            1.29
    FLOW VELOCITY(FEET/SEC.) =           1.819
    FLOW VELOCITY HEAD(FEET) =           0.051
    HYDRAULIC DEPTH(FEET) =       0.17
    FROUDE NUMBER =     0.788
    SPECIFIC ENERGY(FEET) =           0.28
============================================================================
```

```
****************************************************************************
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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:55  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* PROJECT SITE                                                             *
* MH 281                                                                   *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   1.000
    PIPE SLOPE(FEET/FEET) =  0.0116
    PIPEFLOW(CFS) =          2.45
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.67
    CRITICAL FLOW AREA(SQUARE FEET) =      0.559
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.940
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =           31.04
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      4.377
    CRITICAL FLOW VELOCITY HEAD(FEET) =             0.30
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =       0.59
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =             0.97
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =        0.58
    FLOW AREA(SQUARE FEET) =        0.47
    FLOW TOP-WIDTH(FEET) =      0.987
    FLOW PRESSURE + MOMENTUM(POUNDS) =             31.93
    FLOW VELOCITY(FEET/SEC.) =           5.180
    FLOW VELOCITY HEAD(FEET) =           0.417
    HYDRAULIC DEPTH(FEET) =       0.48
    FROUDE NUMBER =      1.319
    SPECIFIC ENERGY(FEET) =            1.00
============================================================================
```

```
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----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 11:55  11/ 9/2015
============================================================================


 ************************** DESCRIPTION OF STUDY **************************
* CONFLUENCE TO TRUNK SEWER                                                *
* MH 284                                                                   *
*                                                                          *
 **************************************************************************

****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   1.000
    PIPE SLOPE(FEET/FEET) =  0.0116
    PIPEFLOW(CFS) =          2.45
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =       0.67
    CRITICAL FLOW AREA(SQUARE FEET) =      0.559
    CRITICAL FLOW TOP-WIDTH(FEET) =   0.940
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =           31.04
    CRITICAL FLOW VELOCITY(FEET/SEC.) =      4.377
    CRITICAL FLOW VELOCITY HEAD(FEET) =            0.30
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.59
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =            0.97
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =        0.58
    FLOW AREA(SQUARE FEET) =        0.47
    FLOW TOP-WIDTH(FEET) =      0.987
    FLOW PRESSURE + MOMENTUM(POUNDS) =           31.93
    FLOW VELOCITY(FEET/SEC.) =           5.180
    FLOW VELOCITY HEAD(FEET) =           0.417
    HYDRAULIC DEPTH(FEET) =       0.48
    FROUDE NUMBER =      1.319
    SPECIFIC ENERGY(FEET) =             1.00
============================================================================
```

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
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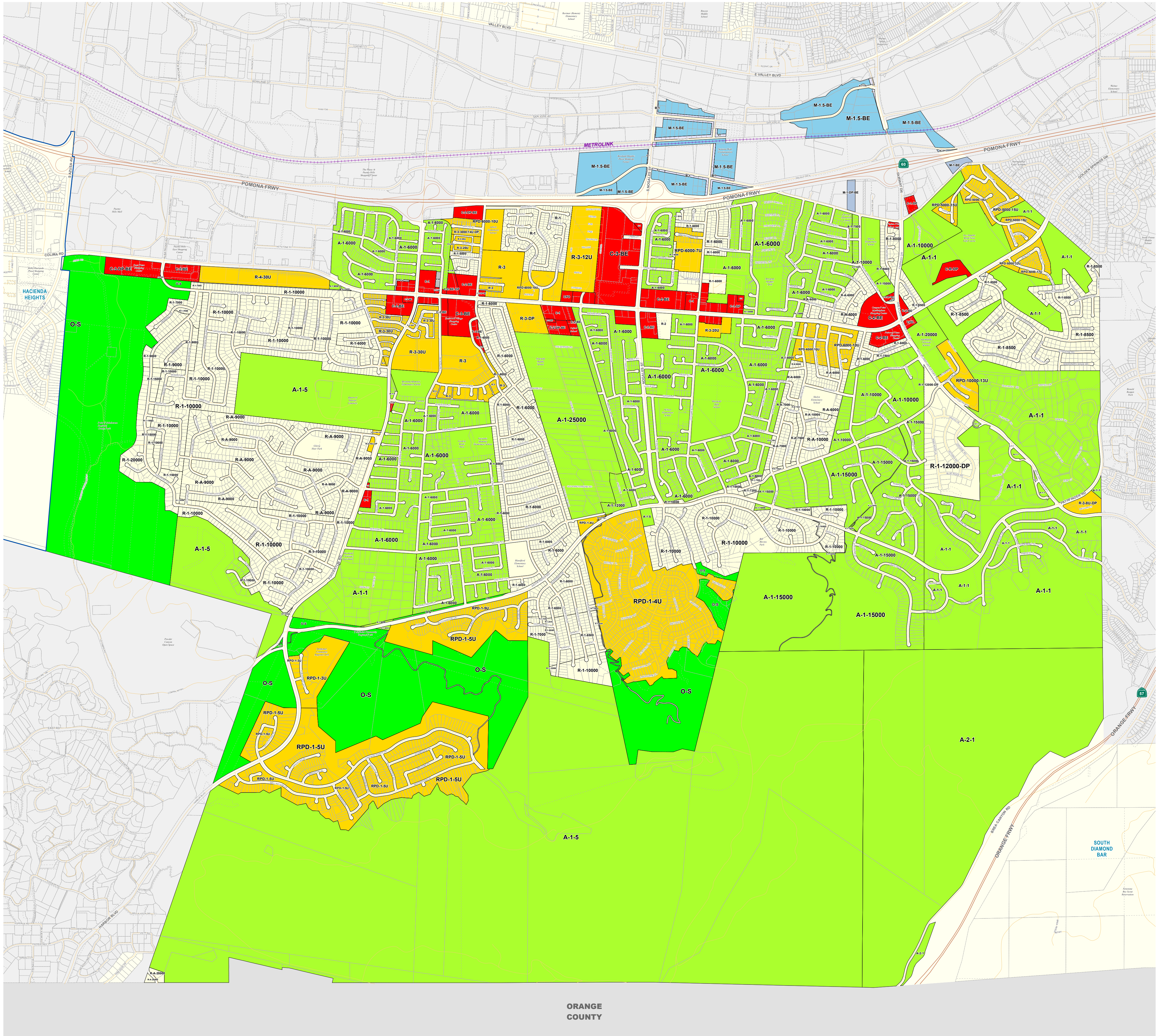
Appendix B

Los Angeles County Regional Planning - Zoning Map

City of Industry General Plan – Zoning Map

Estimated Average Daily Sewage Flows for Various Occupancies

Flow Diagram for the Design of Circular Sanitary Sewers - County Standard S-C4



Los Angeles County

ROWLAND HEIGHTS

Zoning

LEGEND

- R-1 - Single-family residence
- R-2 - Two-family residence
- R-3-()U - Limited multiple residence
- R-4-()U - Unlimited residence
- R-A - Residential agriculture
- A-1 - Light agriculture
- A-2 - Heavy agriculture
- C-H - Commercial highway
- C-1 - Restricted business
- C-2 - Neighborhood commercial
- C-3 - Unlimited commercial
- C-M - Commercial manufacturing
- C-R - Commercial recreation
- M-1 - Light manufacturing
- M-2 - Heavy manufacturing
- M-3 - Unclassified
- M-4 - Unlimited manufacturing
- M-2.5 - Aircraft, heavy industrial
- D-2 - Desert-Mountain
- IT - Institutional
- SP - Specific Plan
- B-1 - Buffer strip
- B-2 - Corner buffer
- R-R - Resort and recreation
- W - Watershed
- P-R - Restricted parking
- SR-D - Scientific research and development
- O-S - Open space
- A-C - Arts and crafts
- MXD - Mixed use development

Base Features

- Lot, Cut/Deed, Subdivision and Easement Line
- Parcels
- City / Unincorporated Community Boundary
- Surrounding City
- Surrounding Unincorporated Community
- Water Feature
- National Forest

Transit Lines

- Metrolink
- Transitways
- Light Rail - Existing
- Light Rail - Proposed
- Light Rail - Under Construction
- Metrolink Stations
- Metro Rail Stations

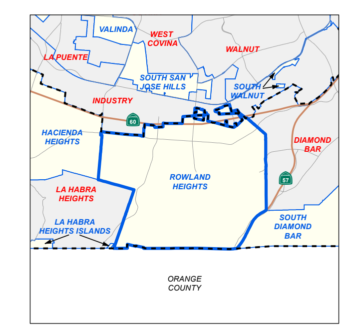
NOTES:

The location of zoning boundaries is as accurate as can be portrayed at this scale. For more precise boundary locations, please contact the Land Development Coordinating Center (LDCC) at (213) 974-6411.

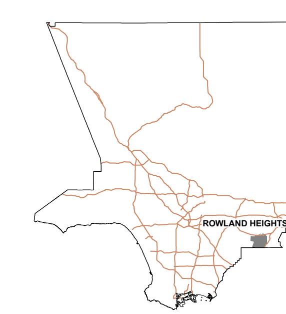
Parcel boundaries are from the parcel database maintained by the Department of Public Works and the Assessor's Office. Parcels shown on the map reflect the most recent update from the Assessor's Office as of February 2012.

Dashed lines represent additional parcel linework such as easements, cut/deed lines, lot lines, subdivision boundaries and tax rate area lines.

VICINITY MAP:



KEY MAP:



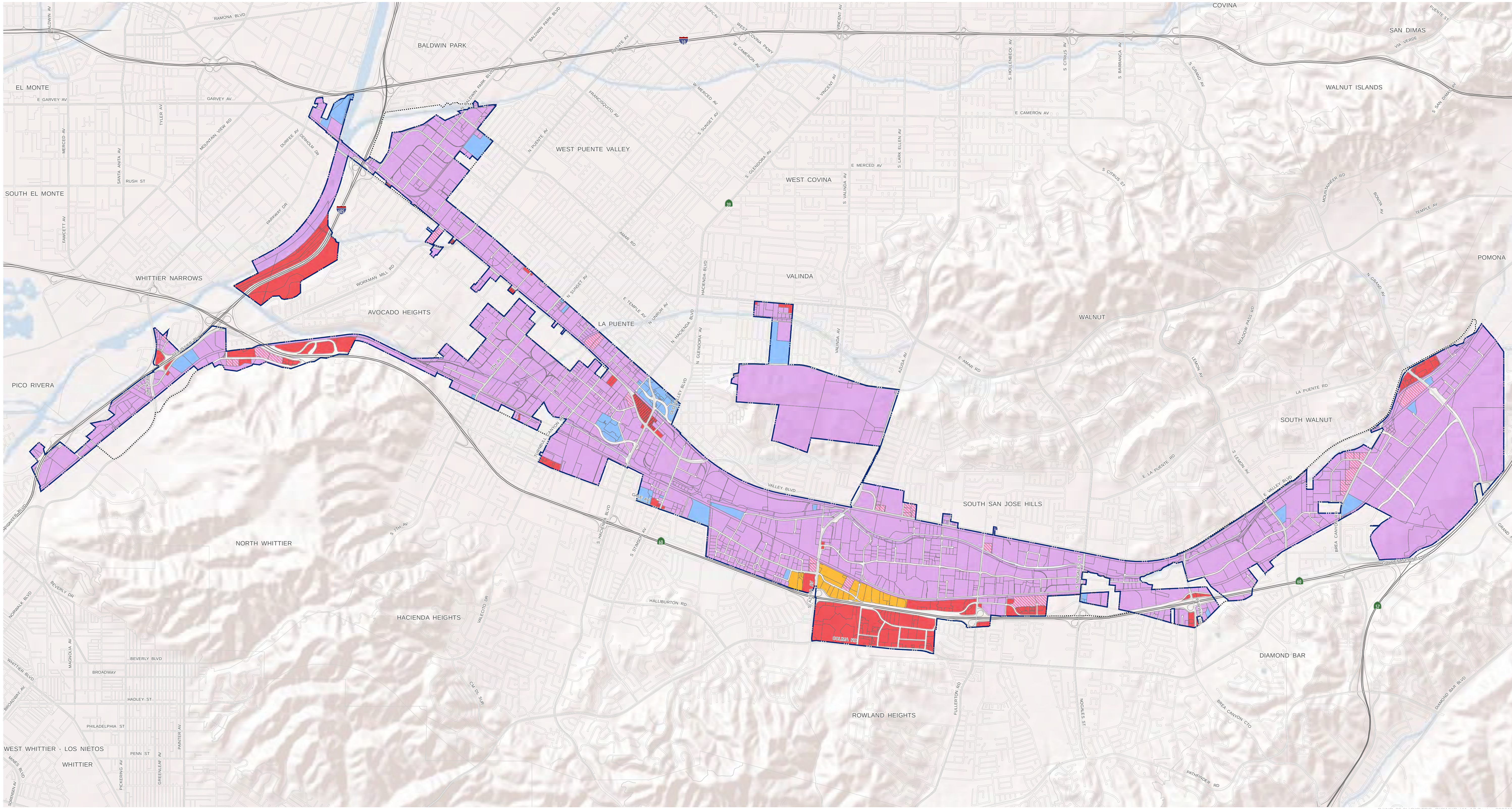
Current as of: June 2012

LOS ANGELES COUNTY
Department of Regional Planning
320 W. Temple St.
Los Angeles, CA 90012

Scale in Feet

0 300 600 1,200 1,800 2,400

..\other\MAP_SERIES\comm_zoning\map_documents\ZONING_2012_Rowland_Heights.mxd



Industrial (I)

Institutional (INST)

Industrial - Commercial Overlay (IC Overlay)

Commercial (C)

Commercial - Adult Business Overlay (AB)

Automobile Zone (AZ)

City of Industry

Sphere of Influence Boundary

THE PLANNING CENTER

1.6.2013

0 2,500 5,000 7,500 10,000 Feet

Zoning

CITY OF INDUSTRY
2011 GENERAL PLAN

Estimated Average Daily Sewage Flows for Various Occupancies

Occupancy	Abbreviation	*Average daily flow	
Apartment Buildings:			
Bachelor or Single dwelling units	Apt	100	gal/D.U. → 150
1 bedroom dwelling units	Apt	150	gal/D.U. → 200
2 bedroom dwelling units	Apt	200	gal/D.U. → 250
3 bedroom or more dwelling units	Apt	250	gal/D.U. → use 300 GPD per SMD
Auditoriums, churches, etc.	Aud	5	gal/seat
Automobile parking	P	25	gal/1000 sq ft gross floor area
Bars, cocktails lounges, etc.	Bar	20	gal/seat
Commercial Shops & Stores	CS	100	gal/1000 sq ft gross floor area
Hospitals (surgical)	HS	500	gal/bed
Hospitals (convalescent)	HC	85	gal/bed
Hotels	H	150	gal/room
Medical Buildings	MB	300	gal/1000 sq ft gross floor area
Motels	M	150	gal/unit
Office Buildings	Off	200	gal/1000 sq ft gross floor area
Restaurants, cafeterias, etc.	R	50	gal/seat
Schools:			
Elementary or Jr. High	S	10	gal/student
High Schools	HS	15	gal/student
Universities or Colleges	U	20	gal/student
College Dormitories	CD	85	gal/student

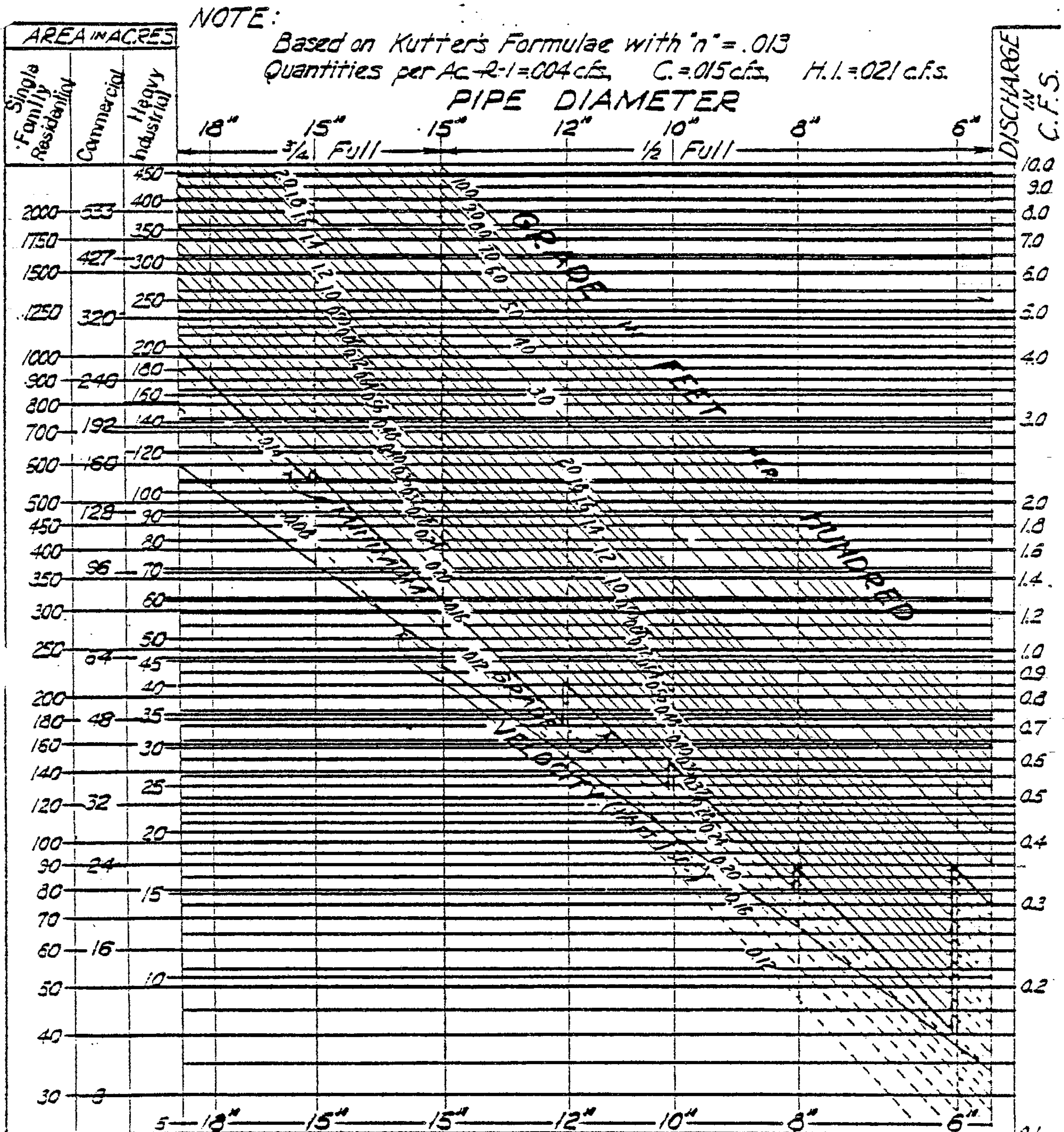
*Multiply the average daily flow by 2.5 to obtain the peak flow

Zoning Coefficients

Zone	Coefficient (cfs/Acre)
Agriculture	**0.001**
Residential+:	
R-1	**0.004**
R-2	**0.008**
R-3	**0.012**
R-4	**0.016***
Commercial:	
C-1 through C-4	**0.015***
Heavy Industrial:	
M1 through M-4	**0.021***

***Individual building, commercial or industrial plant capacities shall be the determining factor when they exceed the coefficients shown**

+ Use 0.001 (cfs/unit) for condominiums only



NOTE: USE 15" 1/2 FULL FOR COMPUTING DESIGN CAPACITY OF A NEW SEWER SYSTEM.
USE 15" 3/4 FULL FOR CHECKING CAPACITY OF EXIST. SEWER SYSTEM.

FLOW DIAGRAM FOR THE DESIGN OF CIRCULAR SANITARY SEWERS

COUNTY OF LOS ANGELES
DEPARTMENT OF COUNTY ENGINEER - FACILITIES

COUNTY ENGINEER STANDARD

S-C4

DATE: 3/80

ASSISTANT DEPUTY

COUNTY ENGINEER

DESIGN

RCE 10443

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

Appendix C

E-2305 - Consolidated County Sewer Maintenance District (S.M.D.) Map

PC-6565 - Sanitary Sewer As-Built

PC-6565R - Sanitary Sewer As-Built

PC-7587 - Sanitary Sewer As-Built

PC-9836 - Sanitary Sewer As-Built

PC-8078 - As-Built

PC-8278 - As-Built

PC-12043 - Sanitary Sewer As-Built

PC-11500 - Sanitary Sewer As-Built

PC-9630 - As-Built

PC-7449 - As-Built

PC-11148 - As-Built

PC-10895 - As-Built

PC-8944 - As-Built

PC-10469 - As-Built

PC-10019 - As-Built

IPC-251 - As-Built

PC-8473 - As-Built

PC-9605 - As-Built

PC-6127 - As-Built

PC-6730 - As-Built


E-2305
SEE SHT. NO. E-2304
SEE SHT. NO. E-2306
CITY OF W. COVINA
CITY OF INDUSTRY
LOS ANGELES COUNTY
L.A. COUNTY
PROJECT SITE
POMONA
VALLEY
SAN JOSE CREEK
THIS MAP IS INTENDED FOR USE ONLY AS OPERATIONS MAP BY LOS ANGELES COUNTY SEWER MAINTENANCE DISTRICTS. LOS ANGELES COUNTY EXPRESSLY DISCLAIMS ANY LIABILITY FOR ANY INACCURACIES WHICH MAY BE PRESENT IN THIS MAP.
U-129
U-130
U-131
U-136
U-137
U-138
METERS
FEET
LEGEND
CLAY SEWERS MAINTAINED BY SMD. 8" UNLESS OTHERWISE NOTED
PLASTIC SEWERS
CONCRETE SEWERS
CLAY SEWERS, LINED
CEMENT SEWERS, LINED
FORCE MAINS
SEWERS NOT MAINTAINED BY SMD
TRUNK SEWERS
CITY BOUNDARY
STANDARD MANHOLE
DROP MANHOLE
SHALLOW MANHOLE
TRAP MANHOLE
WEIR MANHOLE
C.O. CLEANOUT
L.H. LAMP HOLE
PUMP STATION
TOTAL MH'S THIS MAP: 726
MAP REV. 01-12-10
MAP REV 12-08-10
DATA BASE REV
CONSOLIDATED S.M.D.
T:679:C-4
AUTOMATED GRAPHICS

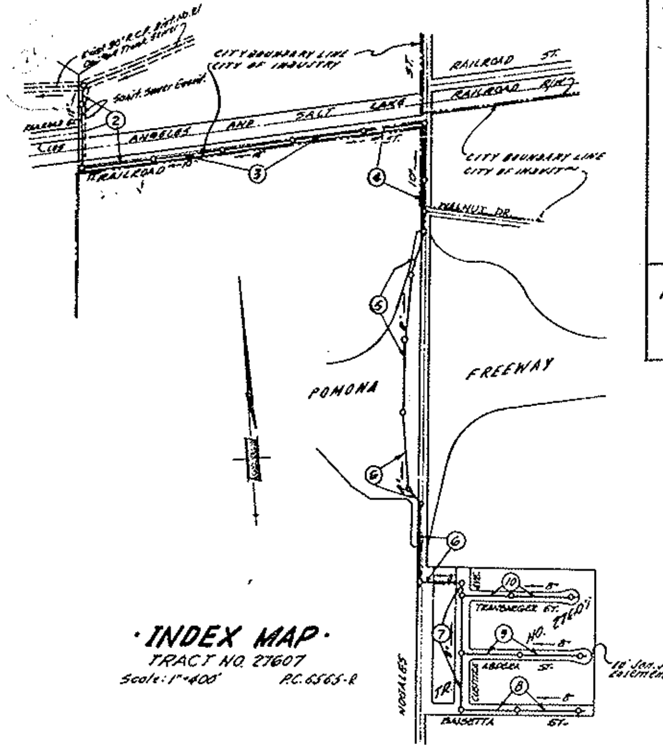
R.M. 5.G. 1279 ELEV. 466.836
F.B. L&T. So. Edge of 12" Stand Pipe ±25' E. Ê Nogales Ave. ±1 Mile S/o Valley Blvd.
OTTERBEIN QUAD. 1955

REVISION
1. Pages 4 & 5 - Relocated Main Line 15' Westerly of ℄ of Nogales St. - Move M.H.'s to agree.
2. Page 6 - Relocated Main Line 13' Westerly of ℄ of Nogales St. - Move M.H.'s to agree.

APPROVED:
BY B.F. Norling R.E. C11636 Date: 3-12-64
Office of the COUNTY ENGINEER

REVISION
Page 2 - Relocated Main Line to fit property Line as determined. Moved M.H. to agree.

APPROVED:
By Gordon W. Kuiel R.C.E. 11856 Date: 4-21-64
Office of the COUNTY ENGINEER



·INDEX MAP·
TRACT NO. 27607
Scale: 1"=400' P.C. 6565-R

COUNTY OF LOS ANGELES SEWER

PERMISSION TO CONNECT TO THIS SEWER TO BE OBTAINED FROM THE COUNTY ENGINEER

Approved Robert S. Rope
City Manager 1-14-64
City of Industry

NOTE: Before any excavation is done near the existing 30" High Pressure Gas Line North of the L.A. & S.L. R.R. R/W it shall be the contractor's responsibility to give the So. Ca. Gas Co. at least 48 Hours notice, Telephone 529-2883, Bros.

NOTICE TO CONTRACTORS
Los Angeles County Road Dep't. requires that on Nogales Street one lane of traffic with Flagman must be maintained during working hours and that two lanes must be maintained at all other times.

LA PUENTE BLDG. DIST. NO. 2

NOTES:

1. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
2. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
3. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND Y BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
4. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
5. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
6. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE, MADISON 9-4747, EXT. 81551, AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
7. MANHOLES SHALL BE BRICK SEWER STRUCTURES PER S-a-104. PRECAST CONCRETE MANHOLES PER S-a-135 OR S-a-173 MAY BE USED AS AN ALTERNATE IN LOCATIONS APPROVED BY THE COUNTY ENGINEER.
8. USE STANDARD MANHOLE FRAMES AND COVERS, S-a-117, EXCEPT AS NOTED.
9. MANHOLE TOPS IN UNIMPROVED RIGHTS-OF-WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
10. USE EXTRA STRENGTH PIPE, ALL PIPE IS STANDARD DEPTH EXCEPT AS NOTED.
11. USE . MECHANICAL COMPRESSION JOINTS FOR ALL V.C.P. JOINTS PER SPEC'S., SECS. 36 & 48. {49

13. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-a-772, CASE III, TWO FEET ON EITHER SIDE FROM THE POINT OF INTERFERENCE.
14. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-a-772, CASE III, UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
15. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE...6'....FEET BELOW CURB GRADE EXCEPT AS NOTED.
16. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
17. FOR ALLOWABLE LEAKAGE TEST USE FORMULA NO....2......., SPEC'S., SEC. 54.
18. ALL STATE & LOCAL TRENCH SAFETY ORDERS WILL BE RIGIDLY ENFORCED
19. "TYTON" TYPE SLIP ON JOINTS MAY BE USED FOR CAST IRON PIPE PER SEC. 40 OF SPECS.

BEFORE BREAKING INTO ANY EXISTING STRUCTURE AND BEFORE FINAL ACCEPTANCE OF THIS WORK COUNTY SANITATION DISTRICT (DU 4 1281) SHALL BE NOTIFIED IN ORDER THAT REQUIRED INSPECTION CAN BE MADE.

NO CONNECTIONS FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS WITHOUT WRITTEN PERMISSION FROM THE CHIEF ENGINEER AND GENERAL MANAGER OF THE COUNTY SANITATION DISTRICTS.

Thomsen Engr. Inc. has shown underground structures and utilities on this project from the best available records and does not accept any responsibility for the location of structures shown nor for the existence of any structure not shown.
It shall be the contractors responsibility to verify the locations of structures shown and the existance of any structures not shown.

COLLECT CHARGES AS INDICATED
D.R. Olsen 11/29/63

PROFILE ALIGNMENT AND GRADE OF

SANITARY SEWERS

P.C. 6565R PAGE 1

TO BE CONSTRUCTED IN

TRACT NO. 27607

PRIVATE CONTRACT NO. 6565-R

W.S. 38

5 SHEETS; 10 PAGES

SCALE: VERT. 1"=4' HORIZ. 1"=40' MAY, 1963

34984

PREPARED IN THE OFFICES OF

THOMSEN ENGINEERING INC.

By: Hans C. Thomsen
REG. C. E. NO. 8244

FOR LEGEND SEE PLAN NO. S-a-64

NOTE:

GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.

ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.

THIS DRAWING AND THE DATA HEREON ARE HEREBY MADE A PART OF THE SPECIFICATIONS.

WORK SHALL BE CONSTRUCTED ACCORDING TO STANDARD SPECIFICATIONS DATED MAY 25, 1962, ON FILE IN THE OFFICE OF THE COUNTY ENGINEER AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.

BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L.A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 1, AND PAY A FEE TO THE COUNTY ENGINEER, ROOM 300, COUNTY ENGINEERING BUILDING, 108 WEST SECOND STREET OR SAN DIMAS REGIONAL OFFICE, SUFFICIENT TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.

APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.

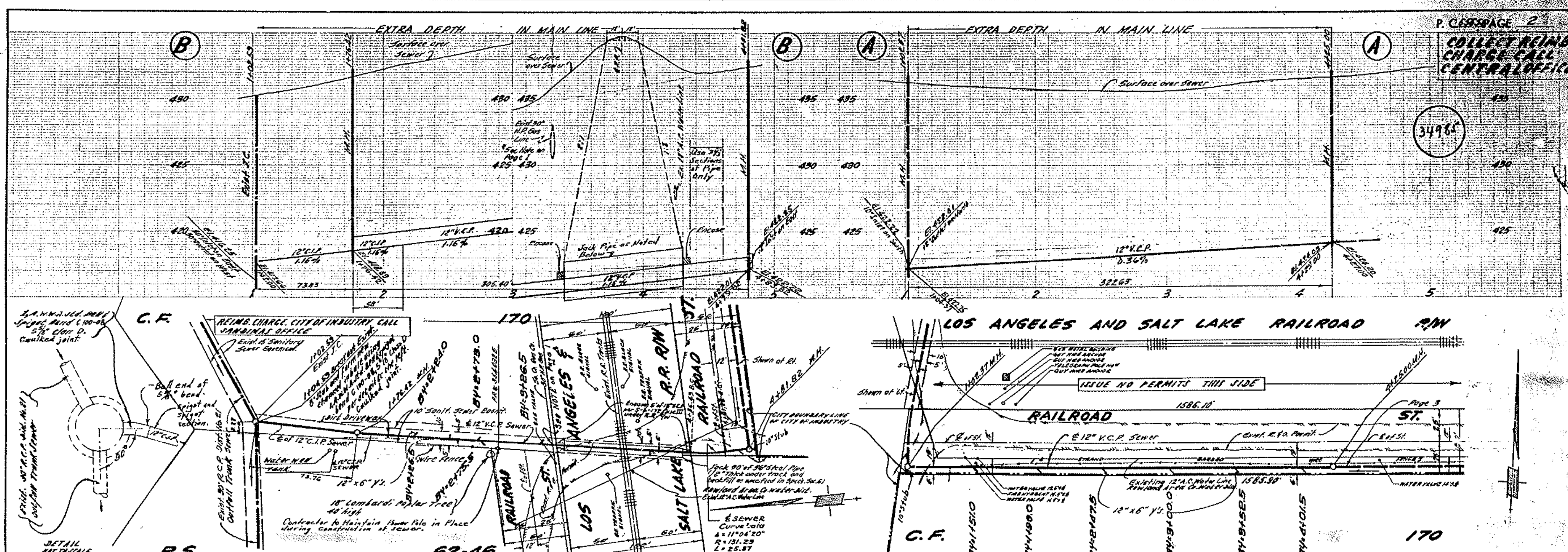
IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.

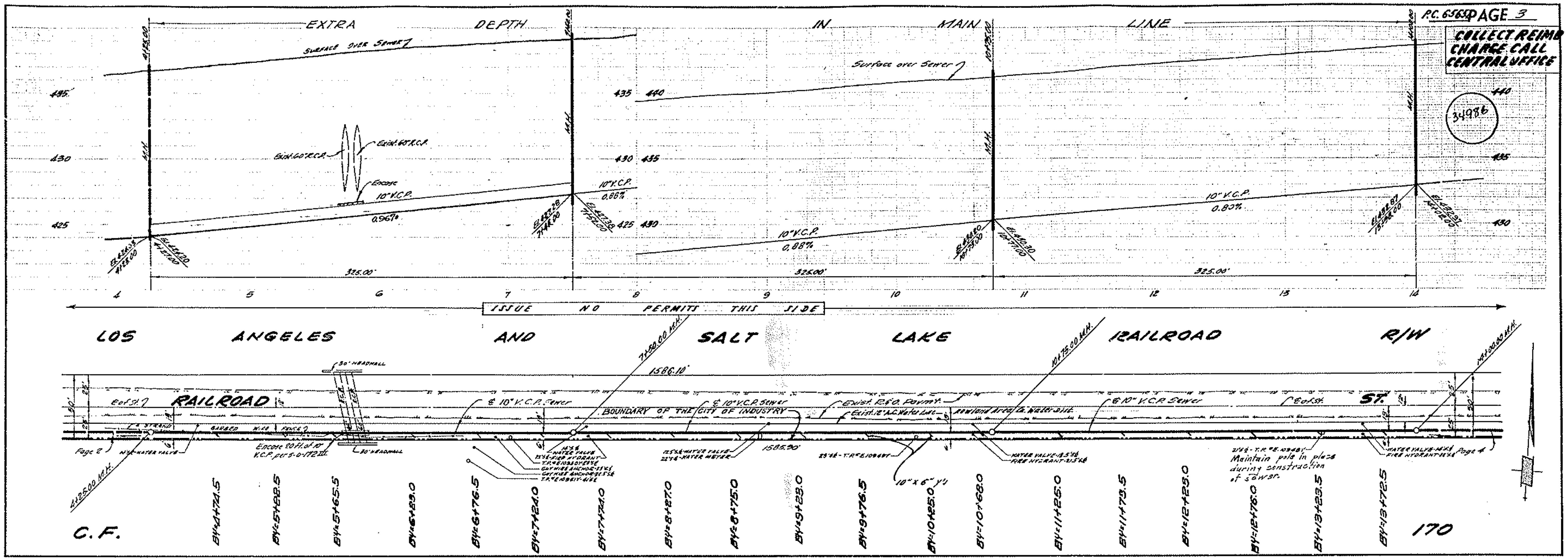
COUNTY OF LOS ANGELES, CALIFORNIA
JOHN A. LAMBIE, COUNTY ENGINEER — J. D. PARKHURST, CHIEF ENGINEER

APPROVED BY, Richard E. Kuhn — ASSISTANT SANITATION ENGINEER
CO. SAN. DIST. NO. 21
APPROVED BY, G. Posthumus — OFFICE ENGINEER

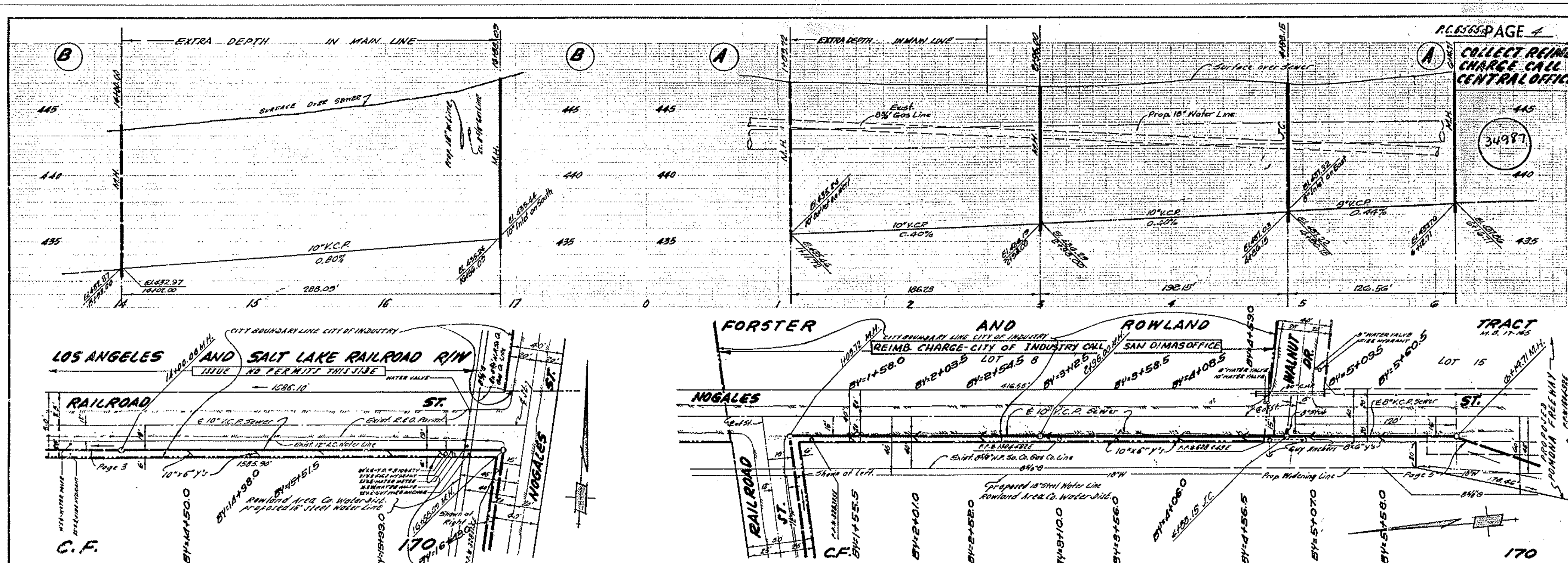
SUBMITTED BY, B.F. Norling
SAN DIMAS REGIONAL OFFICE R.C.E. No 11636
CHECKED BY, 11-29-63
REG. C.E. NO. 10943

J.N. 0360.29

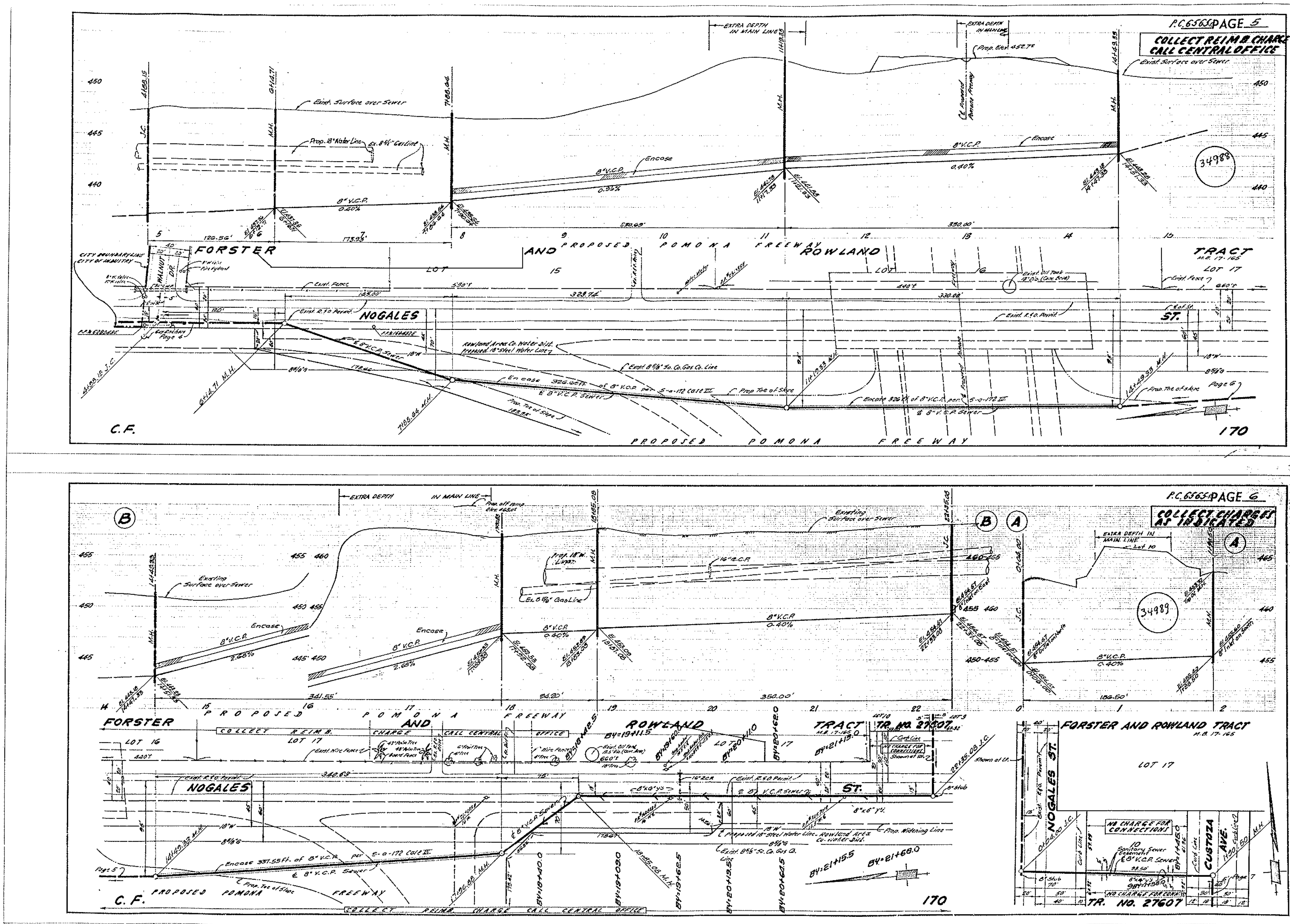




P.C. 6565 PAGE 3
COLLECT REIMB CHARGE CALL CENTRAL OFFICE
34986
EXTRA DEPTH IN MAIN LINE
Surface over Sewer
10" V.C.P.
0.96%
0.88%
0.80%
325.00'
ISSUE NO PERMITS THIS SIDE
LOS ANGELES AND SALT LAKE RAILROAD R/W
RAILROAD ST.
1586.10'
℄ 10" V.C.P. Sewer
BOUNDARY OF THE CITY OF INDUSTRY
Rowland Area Co. Water Dist.
Maintain pole in place during construction of sewer.
10" x 6" Y's
Page 2
Page 4
C.F.
170



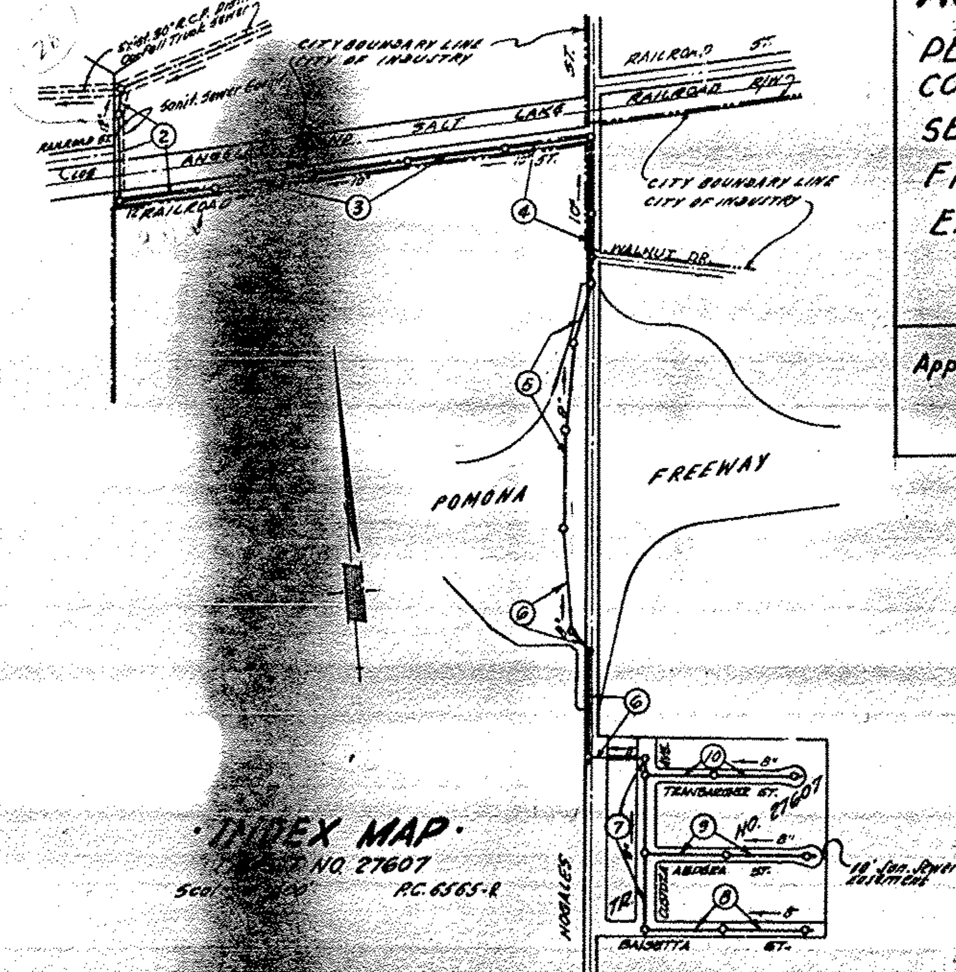
P.C. 6565 PAGE 4
COLLECT REIMB CHARGE CALL CENTRAL OFFICE
34987
EXTRA DEPTH IN MAIN LINE
SURFACE OVER SEWER
Surface over Sewer
Prop. 18" Water Line
10" V.C.P.
0.80%
0.40%
8" V.C.P.
0.44%
283.09'
186.28
198.15'
126.56'
LOS ANGELES AND SALT LAKE RAILROAD R/W
ISSUE NO PERMITS THIS SIDE
RAILROAD ST.
NOGALES ST.
1586.10'
℄ 10" V.C.P. Sewer
10" x 6" Y's
Page 3
Rowland Area Co. Water Dist. proposed 18" steel Water Line
FORSTER AND ROWLAND TRACT
REIMB. CHARGE-CITY OF INDUSTRY CALL SAN DIMAS OFFICE
LOT 8
LOT 15
WALNUT DR.
NOGALES ST.
RAILROAD ST.
Proposed 18" Steel Water Line Rowland Area Co. Water Dist.
Prop. Widening Line
Page 5
POMONA FREEWAY
C.F.
170


P.C. 6565 PAGE 5
COLLECT REIM. B. CHARGE
CALL CENTRAL OFFICE
34988
FORSTER AND ROWLAND TRACT
PROPOSED POMONA FREEWAY
NOGALES ST.
C.F.
170
P.C. 6565 PAGE 6
COLLECT CHARGES AS INDICATED
34989
FORSTER AND ROWLAND TRACT
TR. NO. 27607
COLLECT REIMB. CHARGE CALL CENTRAL OFFICE
NO CHARGE FOR CONNECTIONS
CUSTOZA AVE.
C.F.
170

B.M. 5.G. 1279 ELEV. 466.836
FD. L&T. So. Edge of 12" Stand Pipe ±25' E. E Nogales AVE. ±1 Mile S/o Valley Blvd.
OTTERBEIN QUAD. 1955

REVISION
1. Pages 4 & 5 - Relocated Main Line 15' Westerly of ℄ of Nogales St. - Move M.H.'s to agree.
2. Page 6 - Relocated Main Line 13' Westerly of ℄ of Nogales St. - Move M.H.'s to agree.
APPROVED:
BY: B.F. Norling R.E. C11636 Date: 3-12-64
Office of the COUNTY ENGINEER

REVISION
Page 2 - Relocated Main Line to fit property Line as determined. Moved M.H. to agree.
APPROVED:
By Anton W. Kuipl R.C.E. 11256 Date: 4-21-64
Office of the COUNTY ENGINEER



COUNTY OF LOS ANGELES SEWER

PERMISSION TO CONNECT TO THIS SEWER TO BE OBTAINED FROM THE COUNTY ENGINEER

Approved Robert S. Rogers
City Manager 1-14-64
City of Industry

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NOTICE TO CONTRACTORS
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COLLECT CHARGES AS INDICATED
D. L. Olson 11/28/63

LA PUENTE BLDG. DIST. NO. 2

NOTES:

1. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
2. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
3. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND Y BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
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5. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
6. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE, MADISON 9-4747, EXT. 81551, AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
7. MANHOLES SHALL BE BRICK SEWER STRUCTURES PER S-a-104. PRECAST CONCRETE MANHOLES PER S-a-135 OR S-a-173 MAY BE USED AS AN ALTERNATE IN LOCATIONS APPROVED BY THE COUNTY ENGINEER.
8. USE STANDARD MANHOLE FRAMES AND COVERS, S-a-117, EXCEPT AS NOTED.
9. MANHOLE TOPS IN UNIMPROVED RIGHTS-OF-WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
10. USE EXTRA STRENGTH PIPE. ALL PIPE IS STANDARD DEPTH EXCEPT AS NOTED.
11. USE MECHANICAL COMPRESSION JOINTS FOR ALL V.C.P. JOINTS PER SPEC'S., SECS. 36 & 48. /69

13. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-a-172, CASE III, TWO FEET ON EITHER SIDE FROM THE POINT OF INTERFERENCE.
14. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-a-172, CASE III, UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
15. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE....6....FEET BELOW CURB GRADE EXCEPT AS NOTED.
16. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
17. FOR ALLOWABLE LEAKAGE TEST USE FORMULA NO....2......., SPEC'S., SEC. 54.
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19. "TYTON" TYPE SLIP ON JOINTS MAY BE USED FOR CAST IRON PIPE PER SEC. 40 OF SPECS.

BEFORE BREAKING INTO ANY EXISTING STRUCTURE AND BEFORE FINAL ACCEPTANCE OF THIS WORK COUNTY SANITATION DISTRICT (DU 4-1221) SHALL BE NOTIFIED IN ORDER THAT REQUIRED INSPECTION CAN BE MADE.

NO CONNECTIONS FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS WITHOUT WRITTEN PERMISSION FROM THE CHIEF ENGINEER AND GENERAL MANAGER OF THE COUNTY SANITATION DISTRICTS.

Thomsen Engr. Inc. has shown underground structures and utilities in this project from the best available records and does not accept any responsibility for the location of structures shown nor for the existence of any structure not shown. It shall be the contractor's responsibility to verify the locations of structures shown and the existence of any structures not shown.

PROFILE ALIGNMENT AND GRADE OF

SANITARY SEWERS

P.C. 6565R PAGE 1

TO BE CONSTRUCTED IN

TRACT NO. 27607

PRIVATE CONTRACT NO. 6565-R

W.S. 38

5 SHEETS; 10 PAGES

SCALE: VERT. 1"—4' HORIZ. 1"—40'

MAY, 1963

34984

PREPARED IN THE OFFICES OF

THOMSEN ENGINEERING INC.

By: Hans C. Thomsen
REG. C. E. NO. 8244

FOR LEGEND SEE PLAN NO. S-a-64

NOTE:

GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.
THIS DRAWING AND THE DATA HEREON ARE HEREBY MADE A PART OF THE SPECIFICATIONS.
WORK SHALL BE CONSTRUCTED ACCORDING TO STANDARD SPECIFICATIONS DATED MAY 25, 1962 ON FILE IN THE OFFICE OF THE COUNTY ENGINEER AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.
BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L.A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 1......, AND PAY A FEE TO THE COUNTY ENGINEER, ROOM 300, COUNTY ENGINEERING BUILDING, 108 WEST SECOND STREET OR ..SAN DIMAS.......................... REGIONAL OFFICE, SUFFICIENT TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.

COUNTY OF LOS ANGELES, CALIFORNIA
JOHN A. LAMBIE, COUNTY ENGINEER
J. D. PARKHURST, CHIEF ENGINEER
CO. SAN. DIST. NO. 21

APPROVED BY, Richard E. Kuhn
ASSISTANT SANITATION ENGINEER

APPROVED BY, [illegible]
OFFICE ENGINEER

SUBMITTED BY, B.F. Norling
SAN DIMAS REGIONAL OFFICE R.C.E. No 11636

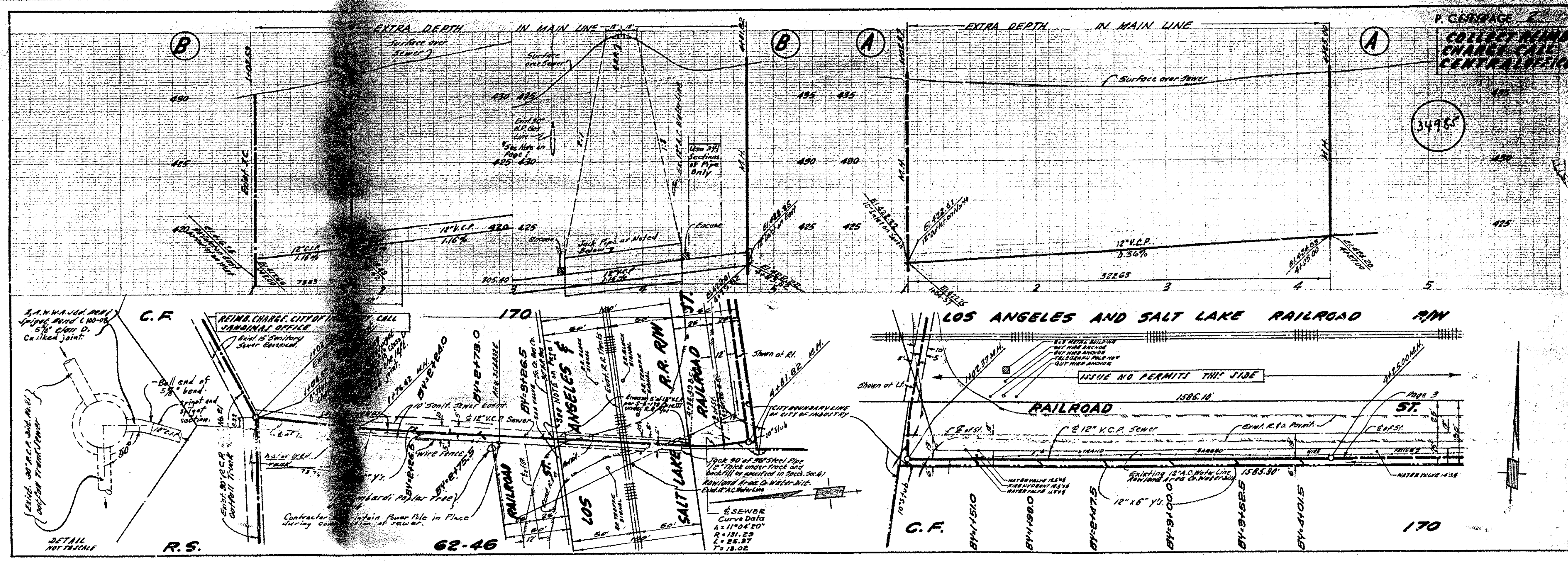
CHECKED BY, [illegible] 11-29-63
REG. C.E. NO. 10543

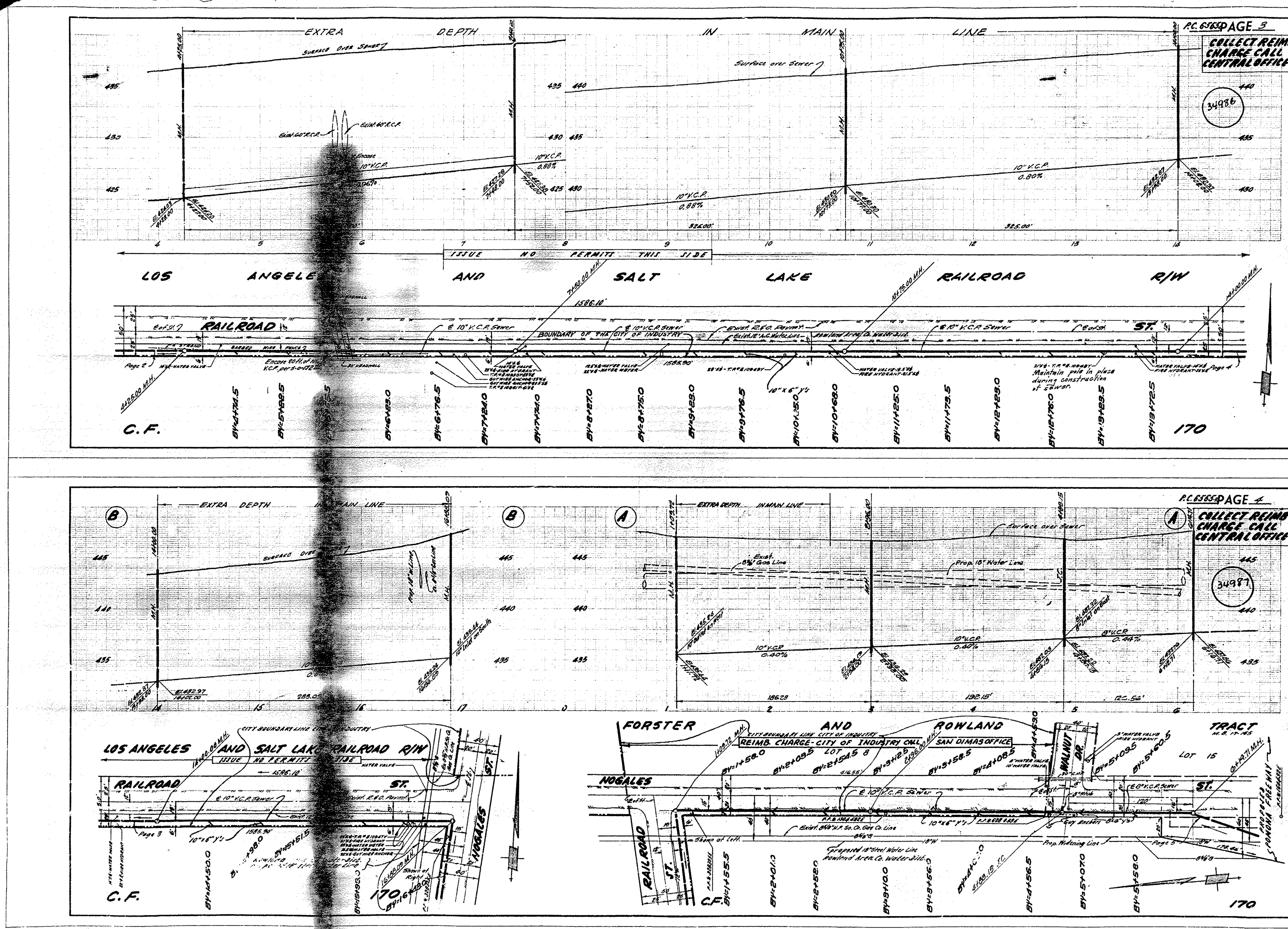
J.N. 0360.29

P.C. 6565R PAGE 2

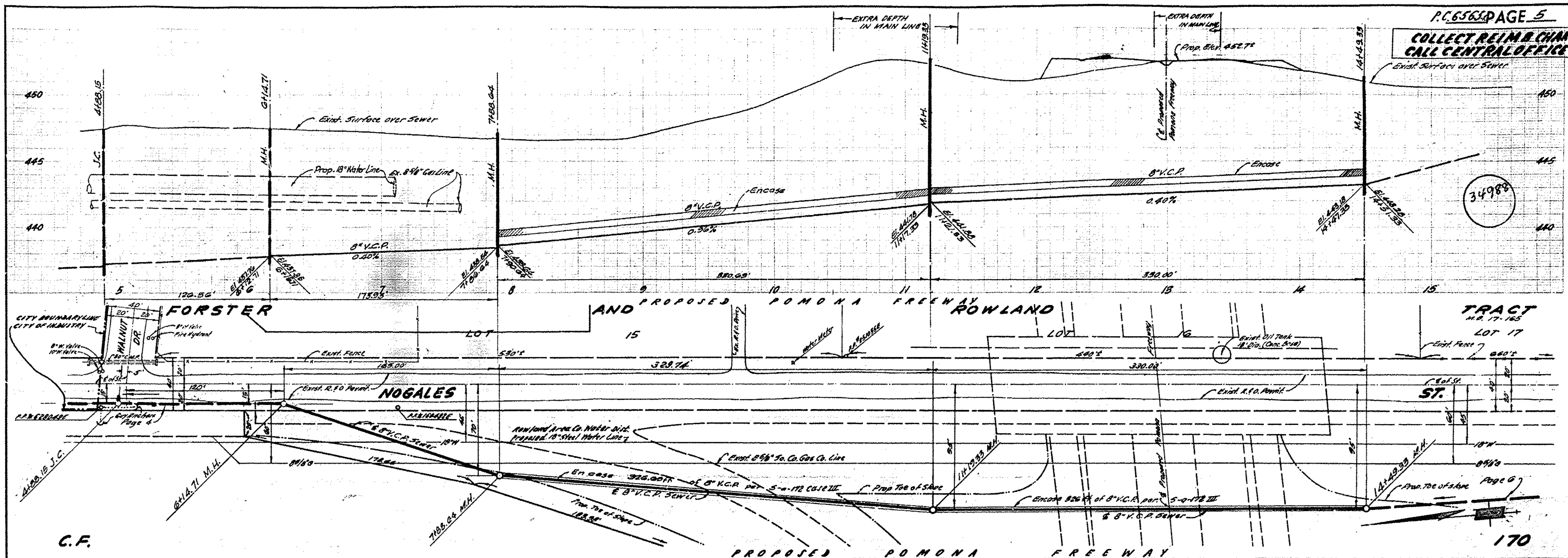
COLLECT REIMB. CHARGE-CALL CENTRAL OFFICE

34985

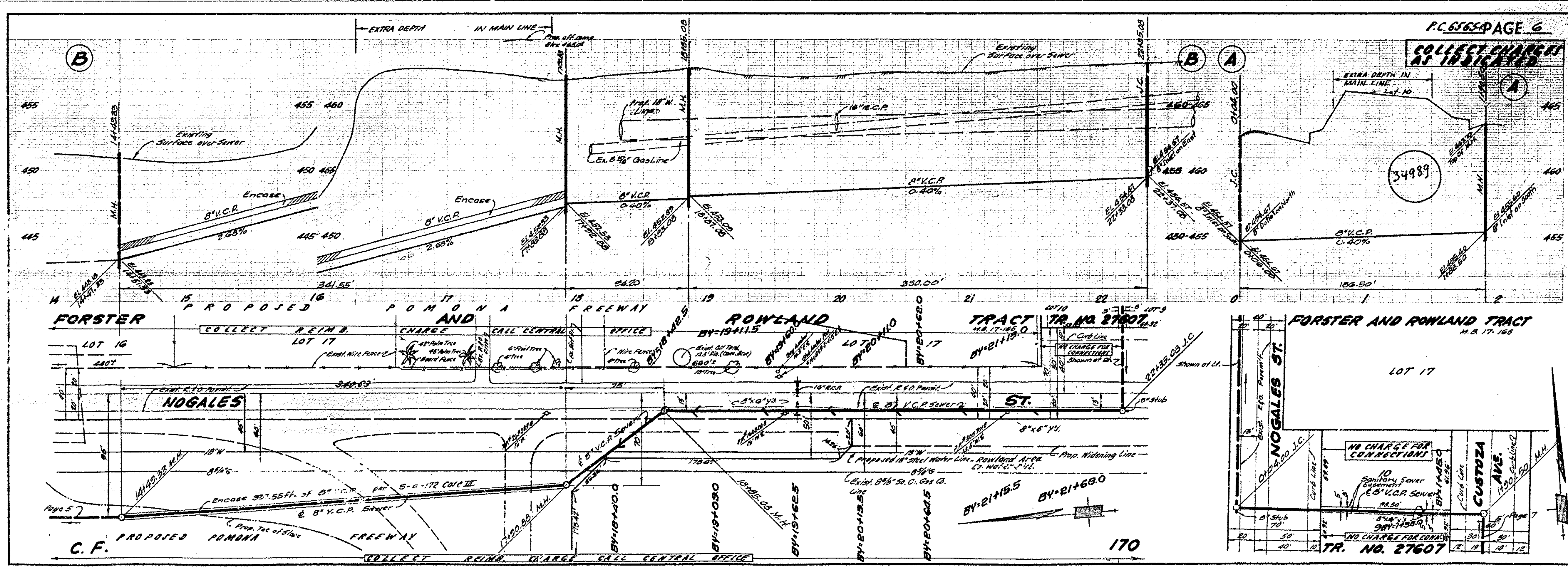




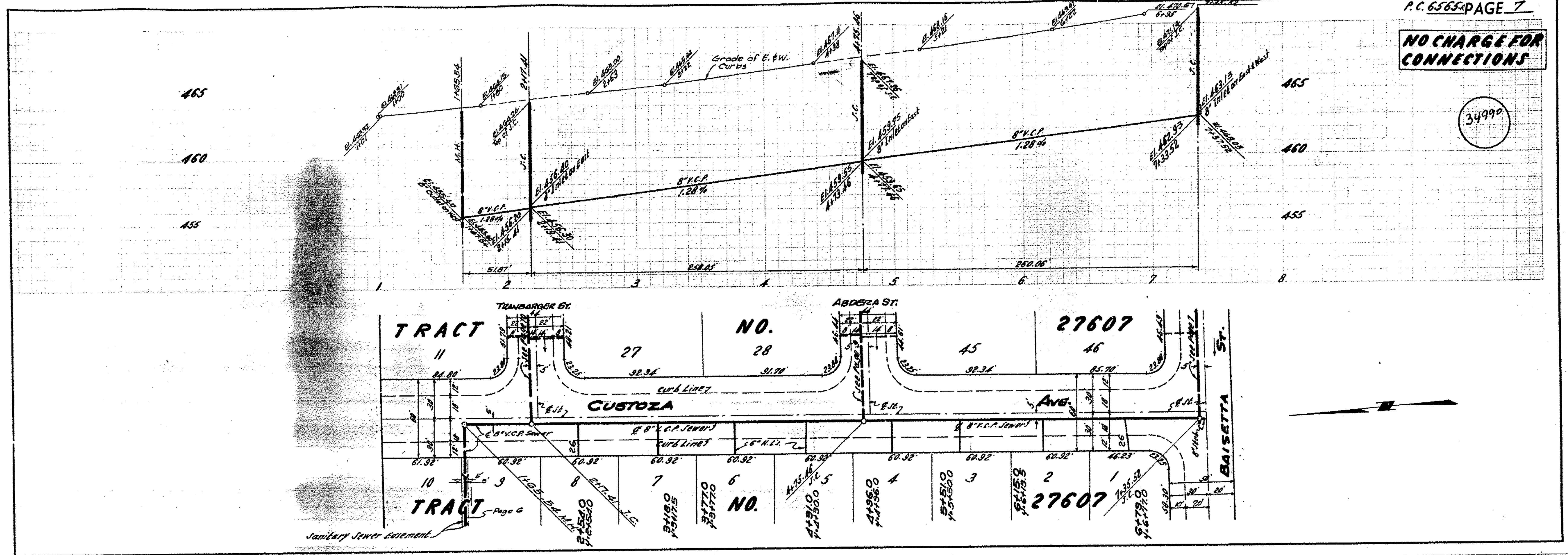
P.C. 6565 PAGE 3
COLLECT REIMB CHARGE CALL CENTRAL OFFICE
34986
EXTRA DEPTH IN MAIN LINE
Surface over Sewer
10" V.C.P. 0.80%
10" V.C.P. 0.88%
ISSUE NO PERMITS THIS SIDE
LOS ANGELES AND SALT LAKE RAILROAD R/W
RAILROAD ST.
BOUNDARY OF THE CITY OF INDUSTRY
℄ 10" V.C.P. Sewer
Maintain pole in place during construction of sewer.
Page 2
Page 4
C.F.
170
P.C. 6565 PAGE 4
COLLECT REIMB CHARGE CALL CENTRAL OFFICE
34987
EXTRA DEPTH IN MAIN LINE
Surface over Sewer
Exist. 8¾" Gas Line
Prop. 18" Water Line
10" V.C.P. 0.40%
8" V.C.P. 0.44%
LOS ANGELES AND SALT LAKE RAILROAD R/W
ISSUE NO PERMITS THIS SIDE
CITY BOUNDARY LINE CITY OF INDUSTRY
RAILROAD ST.
NOGALES ST.
Page 3
C.F.
170
FORSTER AND ROWLAND TRACT
REIMB. CHARGE - CITY OF INDUSTRY CALL SAN DIMAS OFFICE
LOT 8
LOT 15
NOGALES ST.
WALNUT DR.
℄ 10" V.C.P. Sewer
Proposed 18" Steel Water Line Rowland Area Co. Water Dist.
Prop. Widening Line
PROPOSED POMONA FREEWAY
RAILROAD ST.
Page 5
C.F.
170



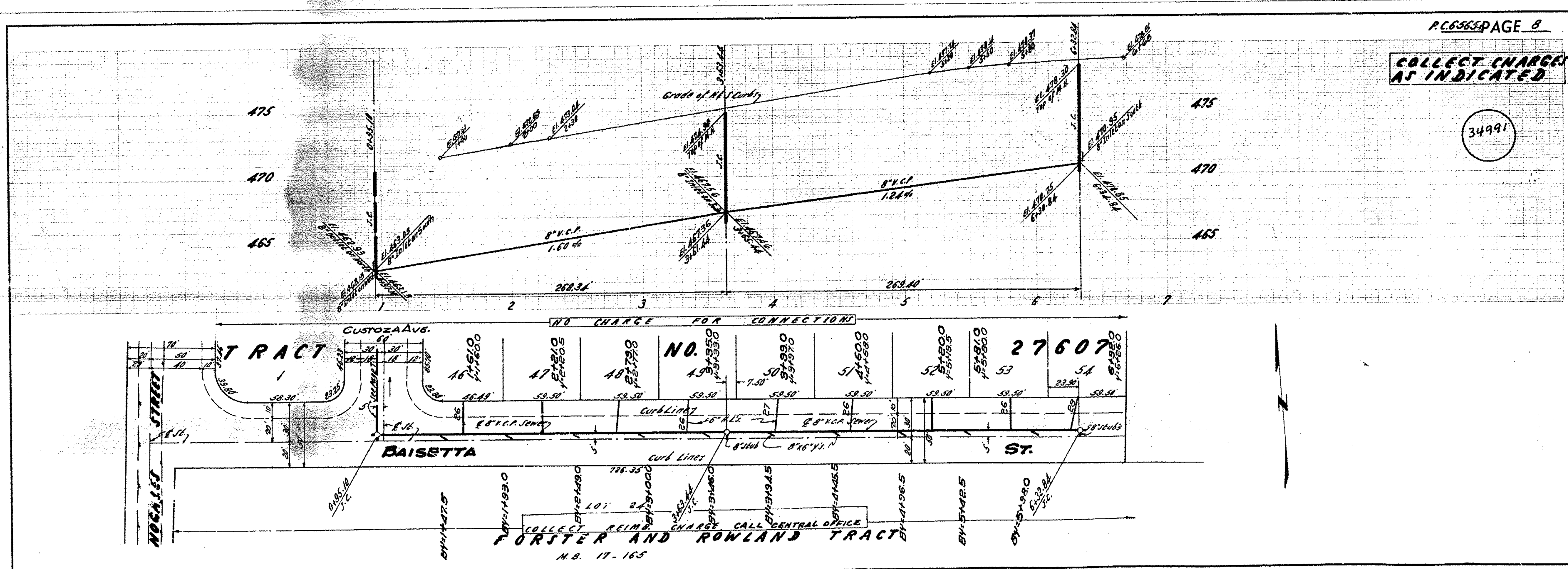
P.C. 6565 PAGE 5
COLLECT REIMB. CHARGE CALL CENTRAL OFFICE
EXTRA DEPTH IN MAIN LINE
Exist. Surface over Sewer
Prop. 18" Water Line
8" V.C.P.
0.40%
0.36%
Encase
34988
FORSTER AND ROWLAND TRACT
M.B. 17-165
LOT 15
LOT 16
LOT 17
PROPOSED POMONA FREEWAY
NOGALES
ST.
WALNUT DR.
CITY BOUNDARY LINE
CITY OF INDUSTRY
Exist. Fence
Exist. Oil Tank
Rowland Area Co. Water Dist.
Proposed 18" Steel Water Line
Encase 326.00 ft of 8" V.C.P. per S-4-172 Case III
Prop. Toe of Slope
Page 4
Page 6
C.F.
170



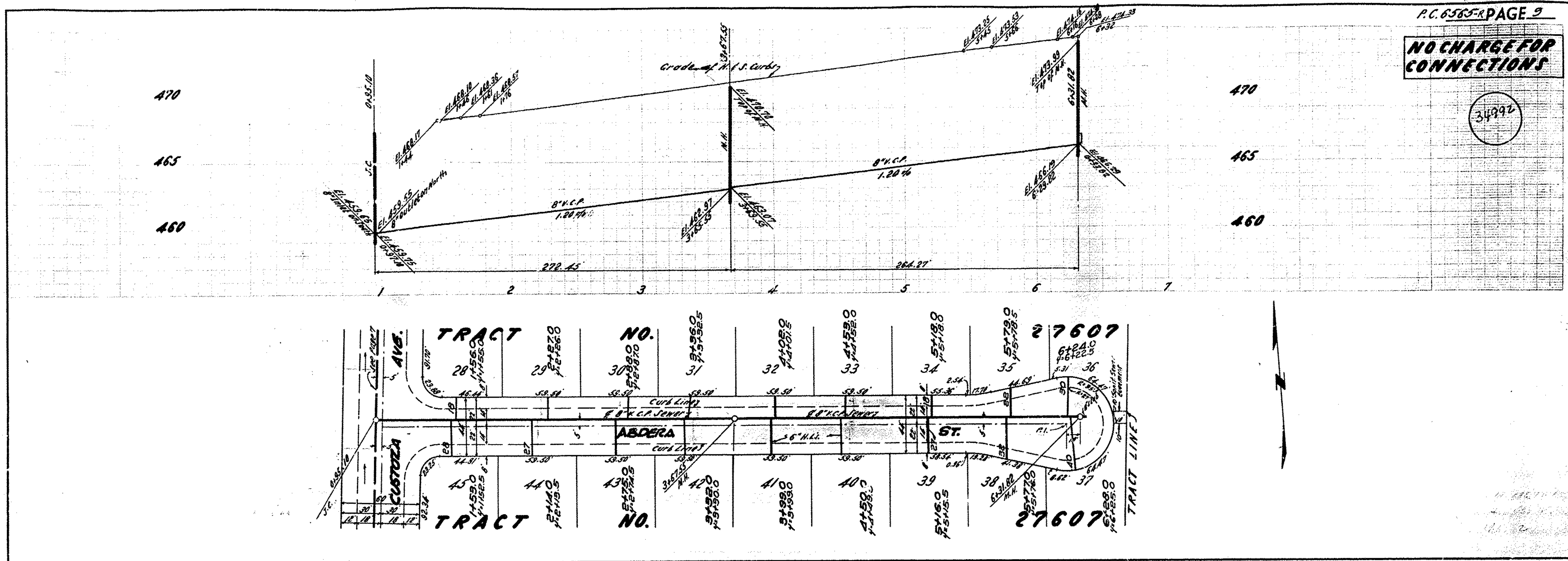
P.C. 6565 PAGE 6
COLLECT CHARGES AS INDICATED
EXTRA DEPTH IN MAIN LINE
Existing Surface over Sewer
8" V.C.P.
2.68%
0.40%
Encase
Ex. 8 5/8" Gas Line
34989
FORSTER AND ROWLAND TRACT
M.B. 17-165
TR. NO. 27607
LOT 16
LOT 17
PROPOSED POMONA FREEWAY
COLLECT REIMB. CHARGE CALL CENTRAL OFFICE
NOGALES
ST.
NOGALES ST.
CUSTOZA AVE.
NO CHARGE FOR CONNECTIONS
Sanitary Sewer Easement
Page 5
Page 7
C.F.
170

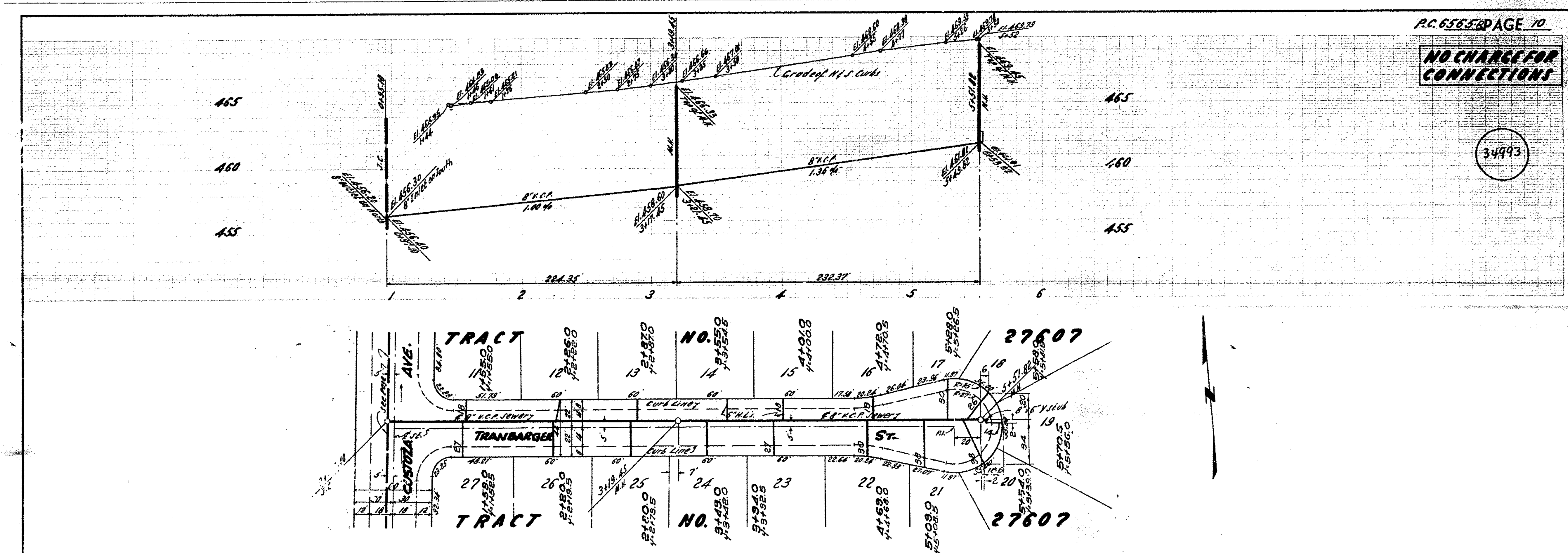


P.C. 6565 PAGE 7
NO CHARGE FOR CONNECTIONS
34990
Grade of E. & W. Curbs
8" V.C.P. 1.28%
TRANBARGER ST.
ABDERA ST.
TRACT NO. 27607
CUSTOZA AVE.
Curb Line
8" V.C.P. Sewer
BAISETTA ST.
Sanitary Sewer Easement
Page 6

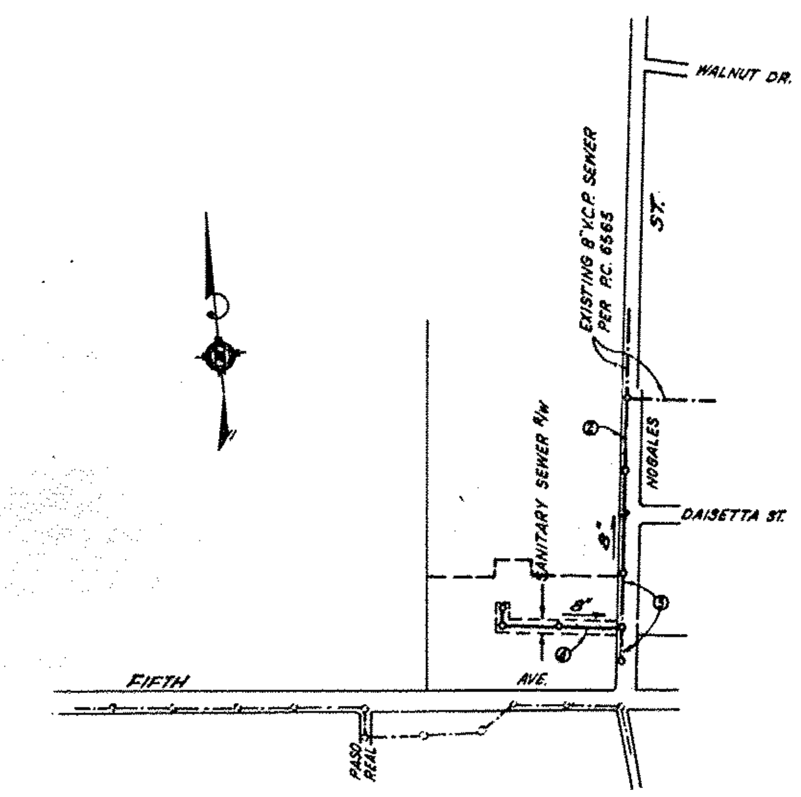


P.C. 6565 PAGE 8
COLLECT CHARGES AS INDICATED
34991
Grade of N. & S. Curbs
8" V.C.P. 1.60%
8" V.C.P. 1.24%
CUSTOZA AVE.
NO CHARGE FOR CONNECTIONS
TRACT NO. 27607
Curb Line
8" V.C.P. Sewer
BAISETTA ST.
NOGALES STREET
COLLECT REIMB. CHARGE CALL CENTRAL OFFICE
FORSTER AND ROWLAND TRACT
M.B. 17-165


P.C. 6565-K PAGE 9
NO CHARGE FOR CONNECTIONS
34992
Grade of N. & S. Curbs
8" V.C.P.
1.20%
M.H.
J.C.
470
465
460
272.45'
264.27'
1
2
3
4
5
6
7
TRACT NO. 27607
CUSTOZA AVE.
ABDERA ST.
Curb Line
8" V.C.P. Sewer
TRACT LINES
N


P.C. 6565-B PAGE 10
NO CHARGE FOR CONNECTIONS
34993
Grade of N. & S. Curbs
8" V.C.P.
1.00%
1.36%
M.H.
J.C.
465
460
455
224.35'
232.37'
1
2
3
4
5
6
TRACT NO. 27607
CUSTOZA AVE.
TRANBARGER ST.
Curb Line
8" V.C.P. Sewer
N

B.M. S.G. 1281 **ELEV.** 488.383
L.&B. Nail No. wing of Hdwl.
50'± So. ℄ of 5th Ave.
22'± E. ℄ of Nogales St.
(Otterbein) **QUAD. 19** 55



INDEX MAP
P.C. 7587
Scale 1"=600'

LA PUENTE BLDG. DIST. NO. 2

NOTES:

1. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
2. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
3. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND "Y" BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
4. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
5. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
6. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE, MADISON 9-4747, EXT. 81551, AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
7. MANHOLES SHALL BE BRICK SEWER STRUCTURES PER S-3. PRECAS ONCRETE MANHOLES PER S-5 OR S-6 MAY BE USED AS AN ALTERNATE IN LOCATIONS APPROVED BY THE COUNTY ENGINEER.
8. USE STANDARD MANHOLE FRAMES AND COVERS, S-15.
9. MANHOLE TOPS IN IMPROVED RIGHTS-OF-WAY TO BE LEVEL WITH FINISHED GRADE EXCEPT AS SHOWN.
10. USE EXTRA STRENGTH PIPE, ALL PIPE IS STANDARD DEPTH EXCEPT AS NOTED.
11. USE MECHANICAL COMPRESSION JOINTS FOR ALL V.C.P. JOINTS PER SPEC'S., SECS. 36, 48 & 49.
12. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-23, TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE.
13. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-23, UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
14. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE
15. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
16. FOR ALLOWABLE LEAKAGE TEST USE FORMULA NO. 2, SPEC'S., SEC. 54.
17. ALL STATE AND LOCAL TRENCH SAFETY ORDERS WILL BE STRICTLY ENFORCED.

NO CONNECTIONS FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS WITHOUT WRITTEN PERMISSION FROM THE CHIEF ENGINEER AND GENERAL MANAGER OF THE COUNTY SANITATION DISTRICTS.

COLLECT CHARGES AS INDICATED
Gerald F. Kenny 3-30-66

APPROVED:
BY: Joseph B. Grenier 5-19-66 DATE
INDUSTRIAL WASTE DIVISION

PROFILE, ALIGNMENT AND GRADE OF
P.C. 7587
PAGE 1

SANITARY SEWERS

CONSTRUCTED IN
NOGALES STREET
& R/W

PRIVATE CONTRACT NO. 7587

W.S. 38
2 SHEETS, 4 PAGES
SCALE: VERT. 1"=4' HORIZ. 1"=40'
FEB, 1966

38345

PREPARED IN THE OFFICES OF
WALSH-FORKERT, CIVIL ENGINEERS, INC.

BY [signature]
REG. C. E. NO. 6371

FOR LEGEND SEE PLAN NO. S-1

NOTE:
GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929. AS REVISED
THIS DRAWING AND THE DATA HEREON ARE HEREBY MADE A PART OF THE SPECIFICATIONS.
WORK SHALL BE CONSTRUCTED ACCORDING TO STANDARD SPECIFICATIONS DATED MAY 23, 1962, ON FILE IN THE OFFICE OF THE COUNTY ENGINEER AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.
BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L.A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 1, AND PAY A FEE TO THE COUNTY ENGINEER, ROOM 250, COUNTY ENGINEERING BUILDING, 108 WEST SECOND STREET OR SAN DIMAS REGIONAL OFFICE, SUFFICIENT TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.

COUNTY OF LOS ANGELES, CALIFORNIA

JOHN A. LAMBIE, COUNTY ENGINEER
J. D. PARKHURST, CHIEF ENGINEER
CO. SAN. DIST. NO. 21
APPROVED BY, Richard E. Kuhns — ASSISTANT SANITATION ENGINEER
APPROVED BY, [signature] — OFFICE ENGINEER

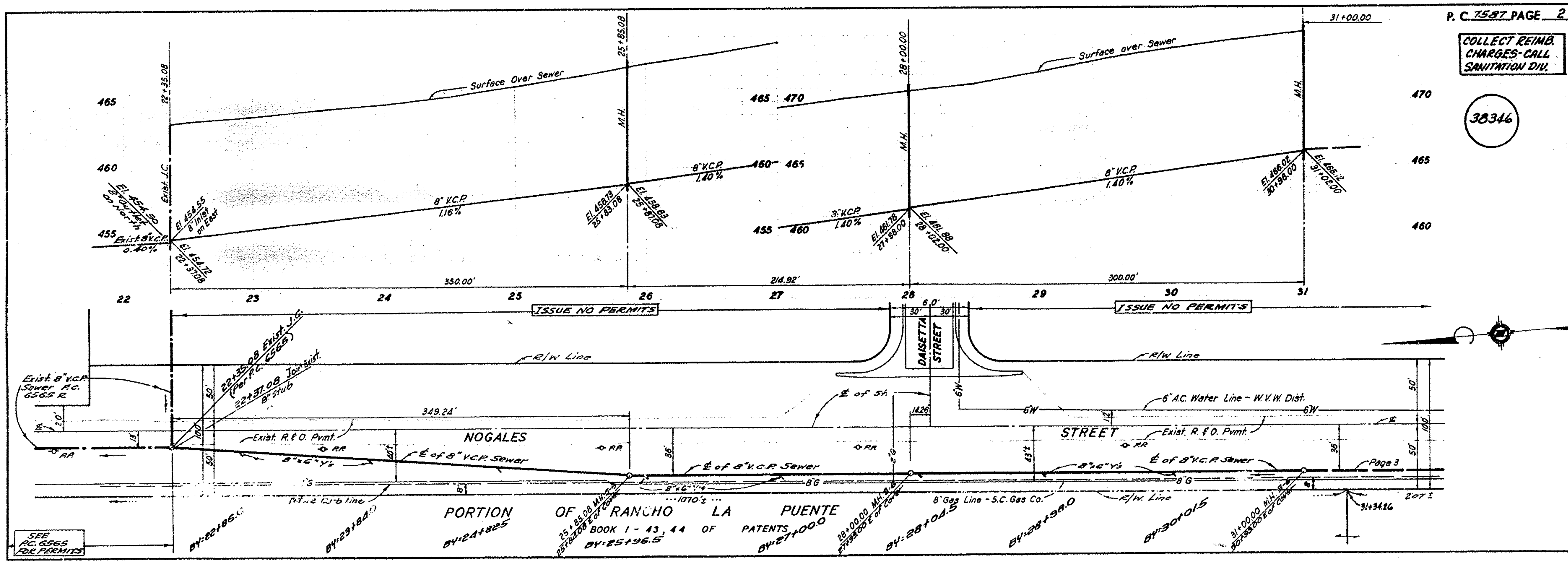
CHECKED BY [signature] 5-20-66
REG. C.E. NO. 10483

J. N. 0367.19

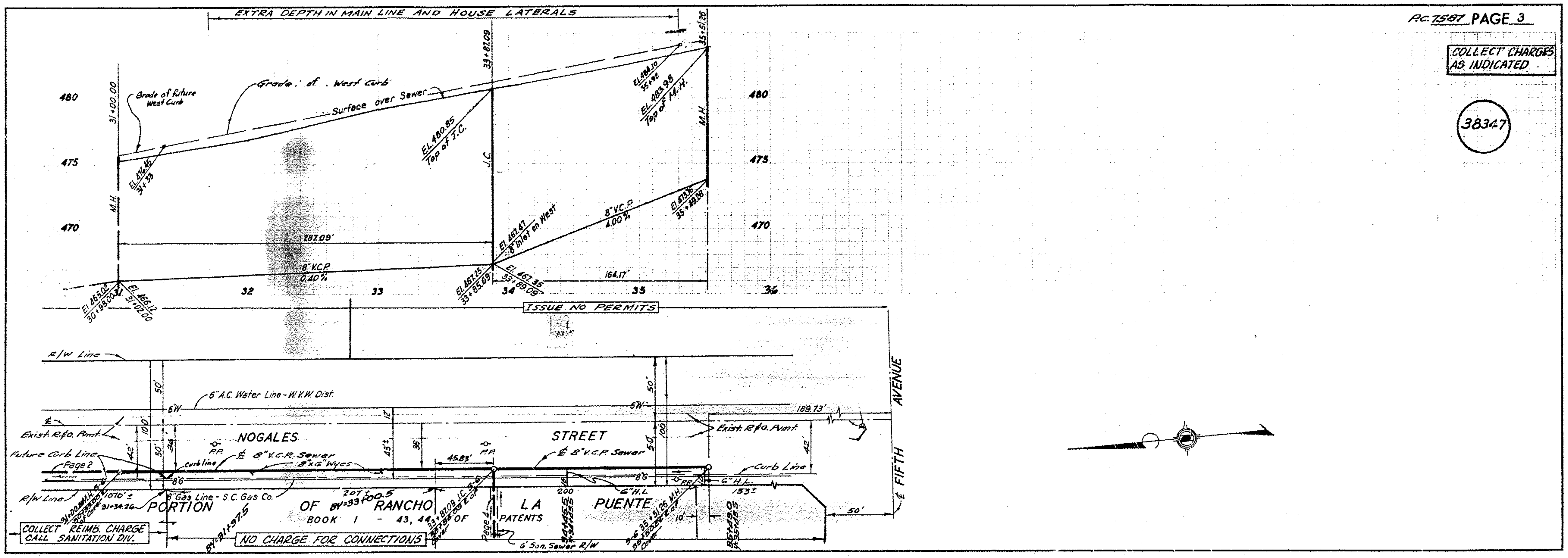
P. C. 7587 PAGE 2

COLLECT REIMB. CHARGES - CALL SANITATION DIV.

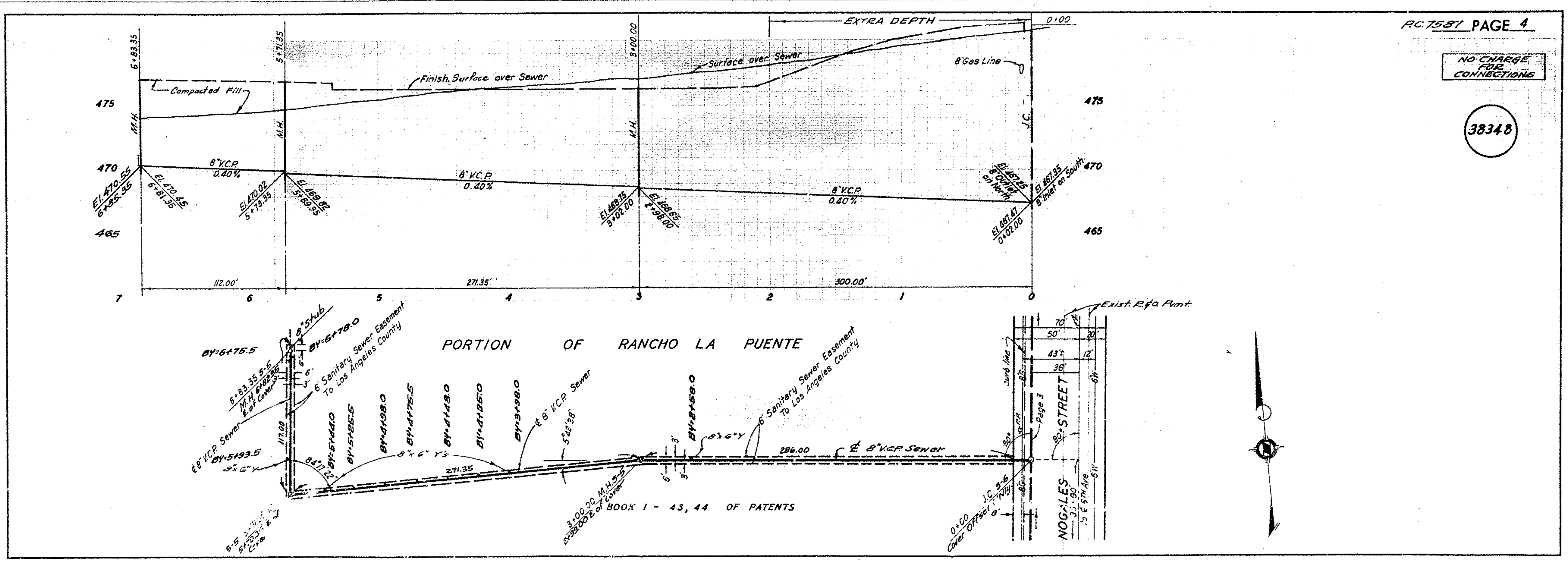
38346



L.A. COUNTY SEWER SHEET P.D. 1 SOUTHERN CALIFORNIA BLUEPRINT CO.

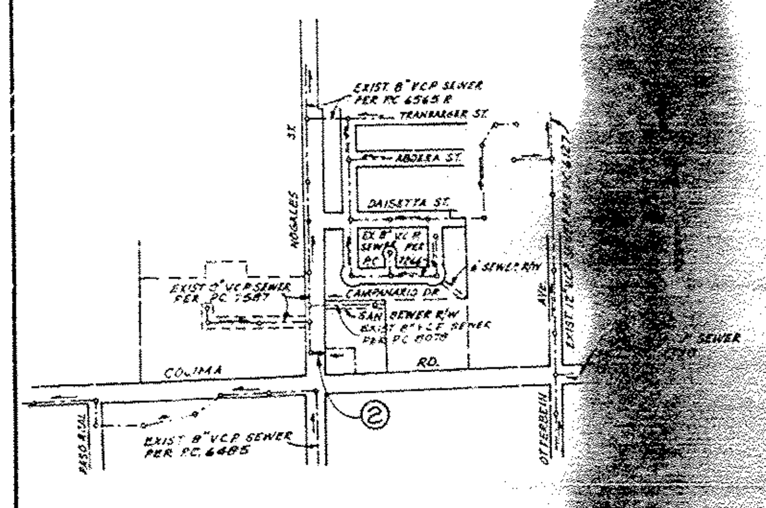


P.C. 7587 PAGE 3
COLLECT CHARGES AS INDICATED
38347
EXTRA DEPTH IN MAIN LINE AND HOUSE LATERALS
Grade of future West Curb
Grade of West Curb
Surface over Sewer
EL 480.85 Top of J.C.
EL 483.98 Top of M.H.
8" V.C.P. 0.40%
8" V.C.P. 4.00%
287.09'
164.17'
ISSUE NO PERMITS
R/W Line
6" A.C. Water Line - W.V.W. Dist.
Exist. Rfo. Pvmt.
Future Curb Line
NOGALES STREET
℄ 8" V.C.P. Sewer
8"x6" Wyes
Curb Line
6" Gas Line - S.C. Gas Co.
PORTION OF RANCHO LA PUENTE
BOOK 1 - 43, 44 OF PATENTS
COLLECT REIMB. CHARGE CALL SANITATION DIV.
NO CHARGE FOR CONNECTIONS
6" San. Sewer R/W
℄ FIFTH AVENUE
189.73'



P.C. 7587 PAGE 4
NO CHARGE FOR CONNECTIONS
38348
EXTRA DEPTH
Compacted Fill
Finish Surface over Sewer
Surface over Sewer
8" Gas Line
8" V.C.P. 0.40%
112.00'
271.35'
300.00'
PORTION OF RANCHO LA PUENTE
6" Sanitary Sewer Easement To Los Angeles County
℄ 6" V.C.P. Sewer
℄ 8" V.C.P. Sewer
286.00
BOOK 1 - 43, 44 OF PATENTS
NOGALES STREET
Exist. Rfo. Pvmt.

B.M. CG 3856 ELEV. 456.271
R.D.B.M. TAG IN CONC. C.B. 38 FT. N B.C.R.
112 FT. N + 42 FT. E/O C/L INT
COLIMA RD. & NOGALES ST.
OTTERBEIN QUAD. 1975



INDEX MAP
SCALE: 1" = 600'
P.C. 9836

NOTE: NUMBER IN CIRCLE INDICATES PAGE NUMBER

REVISION NO 1 DATE AUGUST 5, 1980
RELOCATED SEWER MANHOLE
2' W'LY FROM STA. 1+72.00
TO STA. 1+70.00 (PAGE NO 2)
APPROVED Ralph David Dievert 8/5/80
OFFICE OF COUNTY ENGINEER

NO CONNECTION FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS UNTIL A PERMIT FOR INDUSTRIAL WASTE WATER DISCHARGE HAS BEEN ISSUED BY THE SANITATION DISTRICTS FOR SAID CONNECTION

BEFORE BREAKING INTO OR CONSTRUCTION ON A COUNTY SANITATION DISTRICT SEWER AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT SANITATION DISTRICT INSPECTOR SHALL BE NOTIFIED BY PHONE 962-8606, SO THAT REQUIRED INSPECTION CAN BE MADE

GENERAL NOTES:

1. ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.
2. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER
3. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK
4. GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
5. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND "Y" OR "T" BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER
6. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
7. BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L.A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 1 AND PAY A FEE TO THE COUNTY ENGINEER, 201 E BONITA AVE, SAN DIMAS REGIONAL OFFICE, TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS
8. IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.
9. APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
10. REFER TO SECTION 7-10.4.1 OF THE STANDARD SPECIFICATIONS, REGARDING SAFETY ORDERS.
11. PRIOR TO ISSUANCE OF THE REQUIRED SEWER CONSTRUCTION PERMIT BY THE COUNTY ENGINEER, THE CONTRACTOR SHALL OBTAIN A PERMIT TO E[illegible]ATE FROM THE STATE OF CALIFORNIA, DEPARTMENT OF INDUSTRIAL RELATIONS, DIVISION OF [illegible]USTRIAL SAFETY, AND SHALL FILE A CERTIFICATE OF WORKERS COMPENSATION INSURANCE WITH THE COUNTY ENGINEER.

CONSTRUCTION NOTES:

1. WORK SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (1979 EDITION) AND COUNTY ENGINEER SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWERS DATED SEPTEMBER 21, 1976 AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.
2. THE CONTRACTOR SHALL NOTIFY THE ENVIRONMENTAL DEVELOPMENT DIVISION BY TELEPHONE (213) 738-2154 AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
3. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE EXCEPT AS NOTED.
4. WYE OR TEE BRANCHES MAY BE USED FOR CONNECTIONS TO MAINLINE SEWERS EXCEPT AS NOTED.
5. ALL STRUCTURES SHALL BE EITHER BRICK MANHOLES PER S-3 OR PRECAST CONCRETE MANHOLES PER S-36, EXCEPT AS NOTED
6. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
7. MANHOLE TOPS IN UNIMPROVED RIGHTS OF WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
8. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "D", "F", OR "G" PER STANDARD SPECIFICATIONS SECTION 208-2.
9. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-23, CASE II, TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE.
10. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-23, CASE II UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
11. ALL JOINTS BETWEEN CAST IRON PIPE AND VITRIFIED CLAY PIPE SHALL BE MADE WITH A RUBBER SLEEVE JOINT, TYPE "C" OR "D", (WITH BUSHING IF NECESSARY) PER STANDARD SPECIFICATIONS, SECTION 208-2
12. SEWERS TO BE TESTED FOR LEAKAGE PER SECTION 306-1.4 OF THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
13. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
14. FULL COMPLIANCE WITH SECTION 306-1.3.5 OF THE SPECIAL PROVISIONS WILL BE REQUIRED FOR BACKFILL IN STREETS. CERTIFICATION OF BACKFILL COMPACTION AND SAND EQUIVALENTS BY A QUALIFIED, REGISTERED TESTING LABORATORY SHALL BE PROVIDED BY THE PERMITTEE PRIOR TO THE ISSUANCE OF A CERTIFICATE OF PARTIAL ACCEPTANCE.

PROFILE, ALIGNMENT AND GRADE OF

SANITARY SEWERS

PAGE 1

TO BE CONSTRUCTED IN

NOGALES ST. N/O COLIMA RD.

PRIVATE CONTRACT NO. 9836

W.S. 38-D.4
1 SHEET ; 2 PAGES
SCALE: VERT. 1" = 4' HORIZ. 1" = 40' MARCH, 1980

47884

PREPARED IN THE OFFICES OF
TAIT AND ASSOCIATES, INC.
900 ORANGEFAIR LN.
ANAHEIM, CALIF., 92801
BY: Richard L. Sciarra
REG. C. E. No. 25917

THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF THE COUNTY ENGINEER SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT.

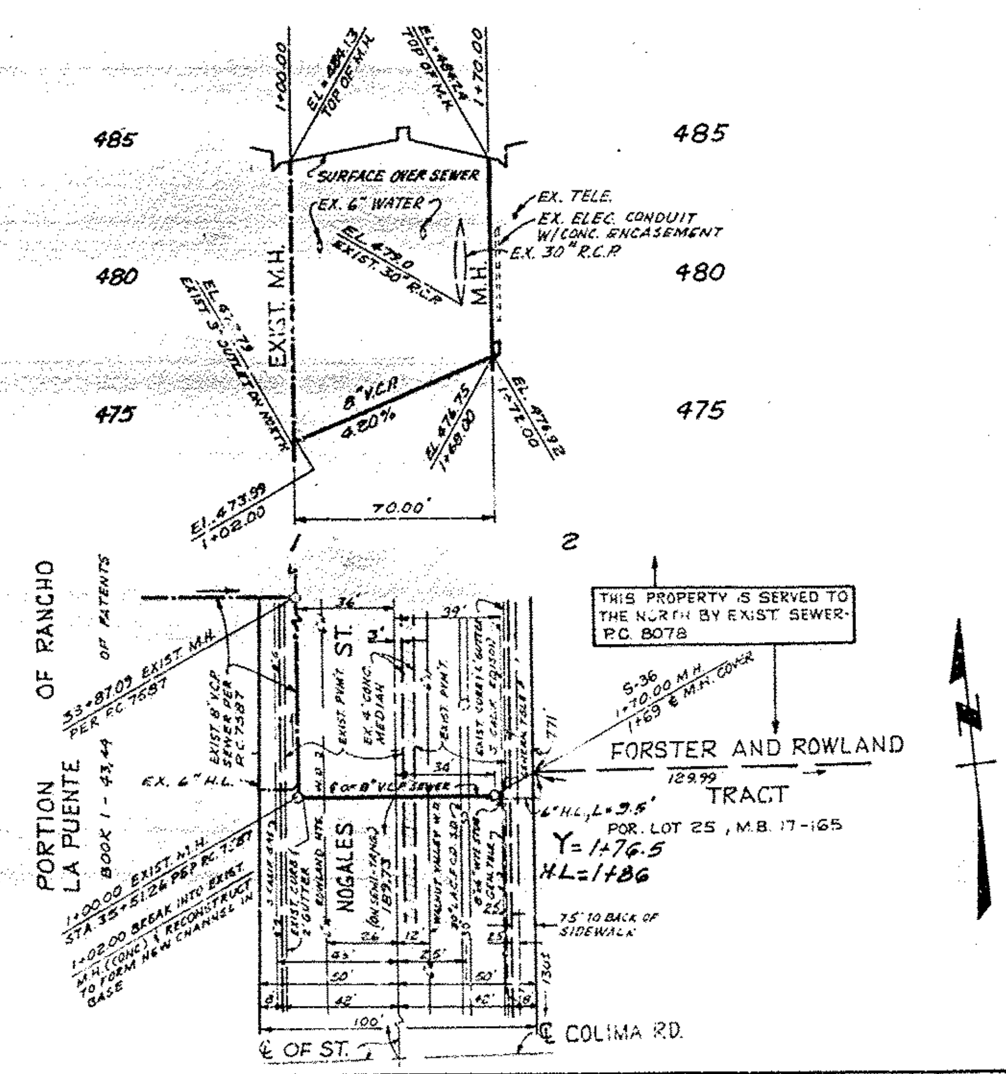
LEGEND	S-1
MINIMUM PUBLIC SAFETY REQUIREMENTS	S-2
BRICK MANHOLE	S-3
STANDARD MANHOLE STEP	S-17
BEDDING FOR SEWER PIPE	S-21
CRADLING AND ENCASEMENT	S-23
WYE OR TEE SUPPORT	S-26
ALLOWABLE TRENCH WIDTHS	S-33
LOCKING MANHOLE FRAME AND COVER	S-35
NON-REINFORCED PRECAST CONCRETE MANHOLE	S-36

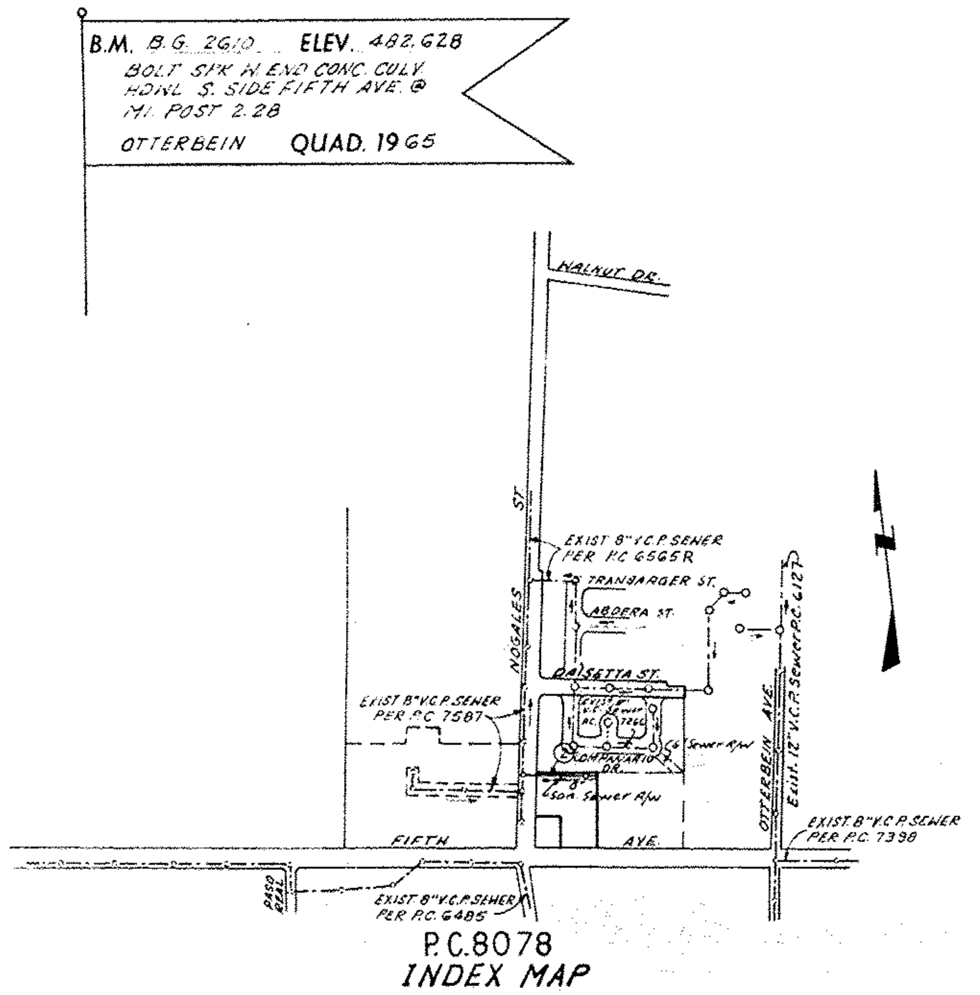
COUNTY OF LOS ANGELES, CALIFORNIA
STEPHEN J. KOONCE, COUNTY ENGINEER   WALTER E. GARRISON, CHIEF ENGINEER
CO. SAN DIST. NO. 21
APPROVED Sam W. Miller 4/15/1980 SAN DIMAS REGIONAL ENGINEER (DATE)   APPROVED Dean M. Fuller for OFFICE ENGINEER 5/5/80
CHECKED Ralph David Dievert 4/17/80 (DATE)
REG. C.E. NO. 16583
LA PUENTE BLDG. DIST. 202

P. C. 9836 PAGE 2

NO CHARGE FOR CONNECTION

47885





P.C.8078
INDEX MAP
SCALE: 1"=600'

THE FOLLOWING COUNTY ENGINEER STANDARD PLANS APPLY TO THIS PROJECT:

LEGEND	S-1
MINIMUM EXCAVATION SAFETY REQUIREMENTS	S-2
BRICK MANHOLE	S-3
NON REINFORCED PRECAST CONCRETE MANHOLE	S-5
REINFORCED PRECAST CONCRETE MANHOLE	S-6
MANHOLE FRAME AND COVER	S-15
MANHOLE STEP	S-17
BEDDING FOR SEWER PIPE	S-21
WYE OR TEE SUPPORT	S-26
ALLOWABLE TRENCH WIDTHS	S-33
CRADLING AND ENCASEMENT	S-73

County Sanitation Districts shall be notified prior to the following so that required inspection can be made (Phone ED. 71026)

(1) Commencement of construction of manhole on District trunk sewer.
(2) Breaking into existing manhole on District trunk sewer.
(3) Core drilling District trunk sewer.
(4) Construction of house connections to District trunk sewer.
(5) Acceptance of the project.

NOTE: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ASCERTAIN AND VERIFY THE TRUE LOCATION OF UNDERGROUND UTILITY PIPES OR STRUCTURES PRIOR TO THE START OF CONSTRUCTION AND TO LOCATE AND PROTECT UTILITY LINES AND STRUCTURES WHETHER SHOWN OR NOT.

LA PUENTE BLDG. DIST. NO. 2

NOTES

1. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE
2. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK
3. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND T OR Y BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER
4. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET
5. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER
6. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE, MADISON 9 4747, EXT 81551, AT LEAST TWENTY FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT
7. ALL STRUCTURES SHALL BE EITHER BRICK MANHOLES PER S-3 OR PRECAST CONCRETE MANHOLES PER S-5 OR S-6 EXCEPT AS NOTED.
8. "T" OR "Y" BRANCHES MAY BE USED FOR CONNECTIONS TO MAINLINE SEWER EXCEPT AS NOTED.
9. MANHOLE TOPS IN IMPROVED RIGHTS OF WAY TO BE LEVEL WITH FINISHED GRADE.
10. USE EXTRA STRENGTH PIPE. ALL PIPE IS STANDARD DEPTH EXCEPT AS NOTED
11. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "D", "F" OR "G" PER STD. SPEC. SEC. 208-2
12. REFER TO SECTION 7-10.A.1 OF THE STANDARD SPECIFICATIONS, REGARDING SAFETY ORDERS.
13. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-22 TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE
14. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-23 UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER
15. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE EXCEPT AS NOTED
16. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS
17. SEWERS TO BE TESTED FOR LEAKAGE PER SECTION 306-2-3-7 STANDARD SPECIFICATIONS
18. SPECIAL BACKFILL IN DESIGNATED AREAS:
    (a) BACKFILL TRENCH AND REPLACE OTHER EARTH REMOVED SO AS TO ACHIEVE THE NATURAL OR FINISHED GRADES AND SLOPES SHOWN ON THE GRADING PLAN APPROVED FOR THIS TRACT BY THE BUILDING AND SAFETY DIVISION.
    (b) ALL BACKFILL AND EARTH REPLACED SHALL BE COMPACTED TO A MINIMUM OF 90% OF MAXIMUM DENSITY PER A.S.T.M. STANDARD METHOD OF TEST D698-57T AS MODIFIED. ACCEPTABLE CERTIFICATION OF SUCH COMPACTION SHALL BE SUBMITTED TO THE CONSTRUCTION DIVISION.
19. ALL JOINTS BETWEEN CAST IRON PIPE AND VITRIFIED CLAY PIPE SHALL BE MADE WITH A RUBBER SLEEVE JOINT, TYPE "C" OR "D", (WITH BUSHING IF NECESSARY) PER STANDARD SPECIFICATIONS, SECTION 208-2.

COLLECT CHARGES AS INDICATED

NO CONNECTIONS FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS WITHOUT WRITTEN PERMISSION FROM THE CHIEF ENGINEER AND GENERAL MANAGER OF THE COUNTY SANITATION DISTRICTS.

PROFILE ALIGNMENT AND GRADE OF

P.C. 8078

SANITARY SEWERS

PAGE 1

CONSTRUCTED IN

R/W E/O NOGALES ST.

PRIVATE CONTRACT NO. 8078

W.S. 38-04

1 SHEET, 2 PAGES

SCALE: VERT. 1"=4' HORIZ. 1"=40'

MAY, 1968

40031

PREPARED IN THE OFFICES OF

TRI-STATE ENGINEERING COMPANY

By Ronald B. Kendricks

REG. C. E. NO. 13324

FOR LEGEND SEE PLAN NO. S-1

NOTE

GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.

ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.

THIS DRAWING AND THE DATA HEREON ARE HEREBY MADE A PART OF THE SPECIFICATIONS. WORK SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AND COUNTY ENGINEER SPECIAL PROVISIONS DATED FEB. 15, 1968 AS REVISED AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.

BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L.A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 1, AND PAY A FEE TO THE COUNTY ENGINEER, ROOM 330, COUNTY ENGINEERING BUILDING, 108 WEST SECOND STREET OR 201 W. BONITA AVE. SAN DIMAS REGIONAL OFFICE, SUFFICIENT TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.

APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.

IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA

COUNTY OF LOS ANGELES, CALIFORNIA

JOHN A. LAMBIE, COUNTY ENGINEER

J. D. PARKHURST, CHIEF ENGINEER

CO. SAN. DIST. NO. 21

APPROVED BY, B.T. Nowning
SAN DIMAS REGIONAL ENGINEER

APPROVED BY
OFFICE ENGINEER

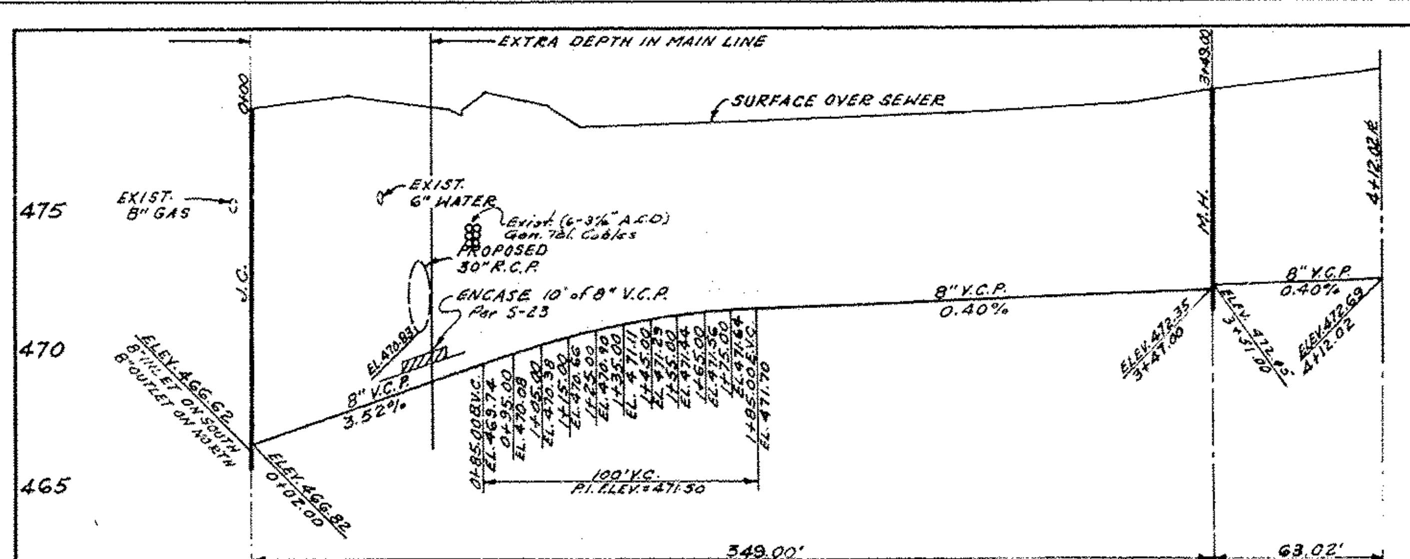
CHECKED BY
REG. C.E. NO. 10443

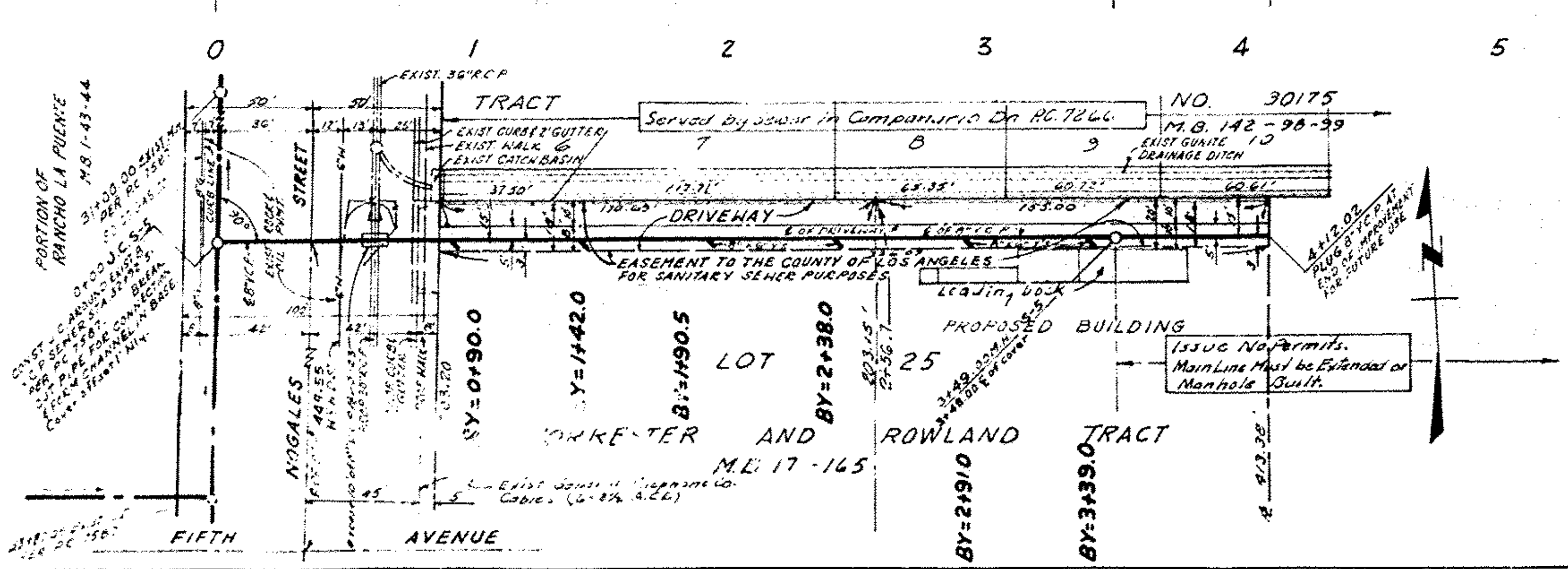
J.N. 0369-17

P.C. 8078 PAGE 2

NO CHARGE FOR CONNECTIONS

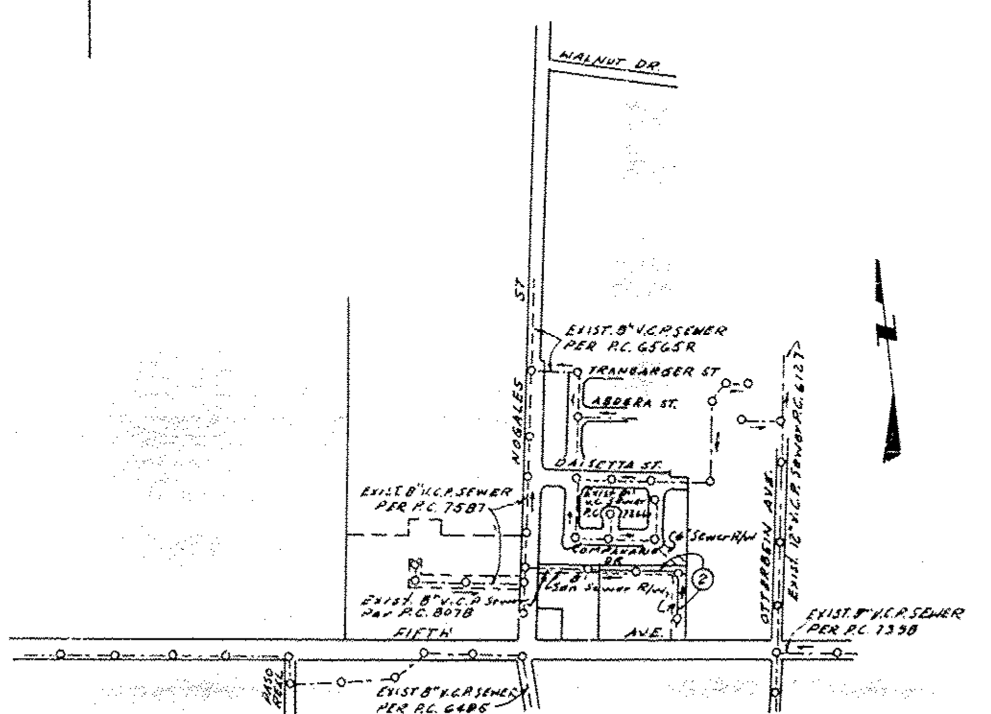
40032





D101746

B.M. B.G. 2610 ELEV. 482.628
BOLT SPK. W. END CONC. CULV. HDWL. S. SIDE FIFTH AVE. @ MI. POST 2.28
OTTERBEIN QUAD. 1965



P.C. 8278
INDEX MAP
SCALE 1" = 600'

No connections for the disposal of industrial wastes shall be made to sewers shown on these drawings without written permission from the Chief Engineer and General Manager of the County Sanitation Districts.

The Following Latest Revised Standard Plans on File in the Office of the County Engineer Shall Apply in the Construction of this Project.

Legend	S-1
Minimum Public Safety requirements	S-2
Brick Manhole	S-3
Non Reinforced precast Conc. Manhole	S-5
Reinforced precast Conc. Manhole	S-6
Manhole Frame and Cover	S-15
Standard Manhole Steps	S-17
Bedding for sewer pipes	S-21
Wye or Tee support	S-26
Allowable Trench Widths	S-33
Cradling and encasement	S-23

FINISHED SURFACE TO BE IN PLACE PRIOR TO ACCEPTANCE OF THIS SEWER

LA PUENTE ~~BLDG.~~ DIST. NO. 2

NOTES:

1. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
2. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
3. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND Y or T BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
4. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
5. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
6. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE, MADISON 9-4747, EXT. 81351, AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
7. All Structures Shall be Brick Manholes per S-3
8. "Y" or "T" Branches May be Used for Connections to Main Line Sewers
9.
10. USE EXTRA STRENGTH PIPE. ALL PIPE IS STANDARD DEPTH EXCEPT AS NOTED.
11. Vitrified Clay Pipe Joints shall be Type "C" "F" or "G" per Std. Specifications Sect. 208.2
12. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-23, TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE.
13. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-23, UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
14. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE EXCEPT AS NOTED.
15. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
16. Sewers to be tested for Leakage per Section 306-2.3.7 of the Std. Specifications
17. All Joints Between Cast Iron Pipe and Vitrified Clay Pipe Shall be Made with a Rubber Sleeve Joint Type "C" or "D" (with Bushings if Necessary) per Std. Specifications Section 208-2

County Sanitation Districts shall be notified prior to the following so that required inspection can be made (Phone 337-1025 - - 686-0009)

Acceptance of the project.

COLLECT CHARGES AS INDICATED

NOTICE TO CONTRACTOR

The existence and location of any underground utility pipes or structures shown on these plans are obtained by a search of the available records. To the best of my knowledge there are no existing utilities except as shown on these plans.
The contractor is required to take due precautionary measures to protect the utility lines shown and any other lines not of record or not shown on these plans.

R.C.E. 12507

PROFILE, ALIGNMENT AND GRADE OF

P.C. 8278 PAGE 1

SANITARY SEWERS

CONSTRUCTED IN

R/W N/O FIFTH AVE.

PRIVATE CONTRACT NO. 8278

W.S. 38 D4

1 SHEET ; 2 PAGES

SCALE: VERT. 1"=4' HORIZ. 1"=40' APRIL, 1969

41172

PREPARED IN THE OFFICES OF

By: REG. C.E. NO. 12507

NOTE:

GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.
THIS DRAWING AND THE DATA HEREON ARE HEREBY MADE A PART OF THE SPECIFICATIONS.
WORK SHALL BE CONSTRUCTED ACCORDING TO STANDARD SPECIFICATIONS DATED Jan. 2, 1969, ON FILE IN THE OFFICE OF THE COUNTY ENGINEER AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.
BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L.A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 1, AND PAY A FEE TO THE COUNTY ENGINEER, ROOM 330, COUNTY ENGINEERING BUILDING, 108 WEST SECOND STREET OR 201 E. Bonita Ave. San Dimas REGIONAL OFFICE, SUFFICIENT TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.

COUNTY OF LOS ANGELES, CALIFORNIA

JOHN A. LAMBIE, COUNTY ENGINEER
J. D. PARKHURST, CHIEF ENGINEER
CO. SAN. DIST. NO. 21

APPROVED BY, SAN DIMAS REGIONAL ENGINEER
APPROVED BY, OFFICE ENGINEER

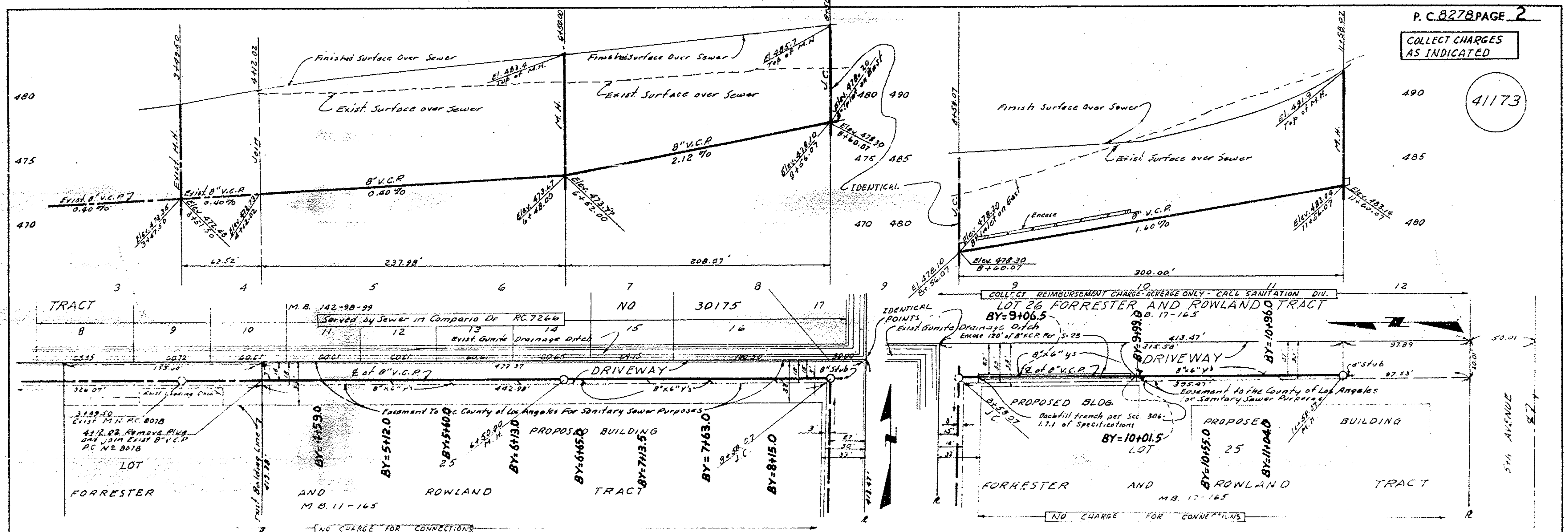
CHECKED BY, 6-16-69
REG. C.E. NO. 10443

J. N. 0969.70

P. C. 8278 PAGE 2

COLLECT CHARGES AS INDICATED

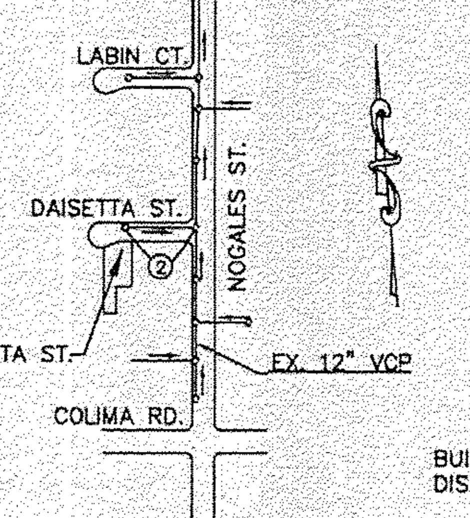
41173



C-100466

BENCH MARKS

BM 5242 Elev. 488.905'
CITY OF INDUSTRY DISK IN N CB 36FT W/O BCR
@ NW COR COLIMA RD. & NOGALES ST.
MKD(1-028 1997)



BUILD AND SAFETY DISTRICT OFFICE: ______

NOTE: NUMBERS IN CIRCLE INDICATES PAGE NUMBER.
ALL MAIN LINE SANITARY SEWERS ARE WITHIN THE SANITARY SEWER EASEMENT

SEWER VIDEO OF ALL SEGMENTS, FINAL MAP & AS-BUILT SEWER PLANS SHALL BE SUBMITTED PRIOR TO PARTIAL FIELD ACCEPTANCE.

INDEX MAP

18958 DAISETTA ST. ROWLAND HEIGHTS
PC NO. 12046
CSMD INDEX E-2305
SCALE: 1"= 600'
THOMAS GUIDE PAGE: 679-B4

NOTICE TO CONTRACTOR:
MAINTAIN SEWER FLOW AT ALL TIMES DURING CONSTRUCTION

NO.	REVISION	REVISED BY	APPROVED BY	DATE

STORMWATER POLLUTION PLAN NOTES:

A. NOTES:

1. ERODED SEDIMENTS AND OTHER POLLUTANTS MUST BE RETAINED ON SITE AND MAY NOT BE TRANSPORTED FROM THE SITE VIA SHEET FLOW, SWALES, AREA DRAINS, NATURAL DRAINAGE COURSES, OR WIND.
2. STOCKPILES OF EARTH AND OTHER CONSTRUCTION RELATED MATERIALS MUST BE PROTECTED FROM BEING TRANSPORTED FROM THE SITE BY THE FORCES OF WIND OR WATER.
3. FUELS, OILS, SOLVENTS AND OTHER TOXIC MATERIALS MUST BE STORED IN ACCORDANCE WITH THEIR LISTING AND ARE NOT TO CONTAMINATE THE SOIL AND SURFACE WATERS. ALL APPROVED STORAGE CONTAINERS ARE TO BE PROTECTED FROM THE WEATHER. SPILLS MUST BE CLEANED UP IMMEDIATELY AND DISPOSED OF IN A PROPER MANNER. SPILLS MAY NOT BE WASHED INTO THE DRAINAGE SYSTEM.
4. EXCESS OR WASTE CONCRETE MAY NOT BE WASHED INTO PUBLIC WAY OR ANY OTHER DRAINAGE SYSTEM. PROVISIONS SHALL BE MADE TO RETAIN CONCRETE WASTES ON SITE UNTIL THEY CAN BE DISPOSED OF AS SOLID WASTE.
5. TRASH AND CONSTRUCTION-RELATED SOLID WASTES MUST BE DEPOSITED INTO A COVERED RECEPTACLE TO PREVENT CONTAMINATION OF RAINWATER AND DISPERSAL BY WIND.
6. SEDIMENTS AND OTHER MATERIALS MAY NOT BE TRACKED FROM THE SITE BY VEHICLE TRAFFIC. THE CONSTRUCTION ENTRANCE ROADWAYS MUST BE STABILIZED SO AS TO INHIBIT SEDIMENTS FROM BEING DEPOSITED INTO THE PUBLIC WAY. ACCIDENTAL DEPOSITIONS MUST BE SWEPT UP IMMEDIATELY AND MAY NOT BE WASHED DOWN BY RAIN OR OTHER MEANS.
7. ANY SLOPES WITH DISTURBED SOILS OR DENUDED OF VEGETATION MUST BE STABILIZED SO AS TO INHIBIT EROSION BY WIND AND WATER.

8. THE FOLLOWING BMPS AS OUTLINED IN, BUT NOT LIMITED TO, THE BEST MANAGEMENT PRACTICE HANDBOOK, CALIFORNIA STORM WATER QUALITY TASK FORCE, SACRAMENTO, CALIFORNIA 2003, OR THE LATEST REVISED EDITION, MAY APPLY DURING THE CONSTRUCTION OF THIS PROJECT (ADDITIONAL MEASURES MAY BE REQUIRED IF DEEMED APPROPRIATE BY THE COUNTY INSPECTORS):

EROSION CONTROL

- EC-1 SCHEDULING
- EC-2 PRESERVATION OF EXISTING VEGETATION
- EC-3 HYDRAULIC MULCH
- EC-4 HYDROSEEDING
- EC-5 SOIL BINDERS
- EC-6 STRAW MULCH
- EC-7 GEOTEXTILES AND MATS
- EC-8 WOOD MULCHING
- EC-9 EARTH DIKES AND DRAINAGE SWALES
- EC-10 VELOCITY DISSIPATION DEVICES
- EC-11 SLOPE DRAINS
- EC-12 STREAMBANK STABILIZATION
- EC-13 POLYACRYLAMIDE

TEMPORARY SEDIMENT CONTROL

- SE-1 SILT FENCE
- SE-2 SEDIMENT BASIN
- SE-3 SEDIMENT TRAP
- SE-4 CHECK DAMS
- SE-5 FIBER ROLLS
- SE-6 GRAVEL BAG BERM
- SE-7 STREET SWEEPING AND VACUUMING
- SE-8 SANDBAG BARRIER
- SE-9 STRAW BALE BARRIER
- SE-10 STORM DRAIN INLET PROTECTION
- SE-11 CHEMICAL TREATMENT

EQUIPMENT TRACKING CONTROL

- TR-1 STABILIZED CONSTRUCTION ENTRANCE/EXIT
- TR-2 STABILIZED CONSTRUCTION ROADWAY
- TR-3 ENTRANCE/OUTLET TIRE WASH

WIND EROSION CONTROL

- WE-1 WIND EROSION CONTROL

WASTE MANAGEMENT & MATERIAL POLLUTION CONTROL

- WM-1 MATERIAL DELIVERY AND STORAGE
- WM-2 MATERIAL USE
- WM-3 STOCKPILE MANAGEMENT
- WM-4 SPILL PREVENTION AND CONTROL
- WM-5 SOLID WASTE MANAGEMENT
- WM-6 HAZARDOUS WASTE MANAGEMENT
- WM-7 CONTAMINATED SOIL MANAGEMENT
- WM-8 CONCRETE WASTE MANAGEMENT
- WM-9 SANITARY/SEPTIC WASTE MANAGEMENT
- WM-10 LIQUID WASTE MANAGEMENT

NON-STORM WATER MANAGEMENT

- NS-1 WATER CONSERVATION PRACTICES
- NS-2 DEWATERING OPERATIONS
- NS-3 PAVING AND GRINDING OPERATIONS
- NS-4 TEMPORARY STREAM CROSSING
- NS-5 CLEAR WATER DIVERSION
- NS-6 ILLICIT CONNECTION/DISCHARGE
- NS-7 POTABLE WATER/IRRIGATION
- NS-8 VEHICLE AND EQUIPMENT CLEANING
- NS-9 VEHICLE AND EQUIPMENT FUELING
- NS-10 VEHICLE & EQUIPMENT MAINTENANCE
- NS-11 PILE DRIVING OPERATIONS
- NS-12 CONCRETE CURING
- NS-13 CONCRETE FINISHING
- NS-14 MATERIAL OVER WATER
- NS-15 DEMOLITION ADJACENT TO WATER
- NS-16 TEMPORARY BATCH PLANTS

B. STANDARD PLANS:

THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF THE FOLLOWING DEPARTMENT SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

- 2000-0 LEGEND FOR SANITARY SEWER PLANS AND PROFILES AND DISTRICT MAPS
- 2002-1 PRECAST CONCRETE SHALLOW MANHOLE
- 2003-2 REINFORCED PRECAST CONCRETE MANHOLE
- 2004-1 RECTANGULAR SHALLOW MANHOLE
- 2014-1 RECTANGULAR MANHOLE FRAME AND COVER
- 2015-1 STANDARD MANHOLE STEP
- 2021-1 BEDDING FOR SEWER PIPE
- 2023-2 CRADLING AND ENCASEMENT
- 2024-1 WYE OR TEE SUPPORT
- 2026-1 EROSION PROTECTION IN STEEP SLOPES
- 2027-1 ALLOWABLE TRENCH WIDTHS
- 6008-1 MINIMUM PUBLIC SAFETY REQUIREMENTS

AMERICAN PUBLIC WORKS ASSOCIATION

- APWA 207-1 PRECAST REINFORCED CONCRETE MANHOLE BASE
- APWA 208-1 BREAKING INTO EXISTING MANHOLES
- APWA 210-2 LOCKING MANHOLE FRAME AND COVER
- APWA 220-2 CHIMNEYS
- APWA 221-1 PIPE ANCHORS BACKFILL STABILIZERS
- APWA 222-1 HOUSE CONNECTION SEWER
- APWA 223-1 HOUSE CONNECTION REMODELING

SANITATION DISTRICTS NOTES

1. NO CONNECTION FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS UNTIL A PERMIT FOR INDUSTRIAL WASTEWATER DISCHARGE HAS BEEN ISSUED BY THE SANITATION DISTRICTS FOR SAID CONNECTION.
2. BEFORE BREAKING INTO OR CONSTRUCTING A SANITATION DISTRICTS' SEWER AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT, A SANITATION DISTRICTS' INSPECTOR SHALL BE NOTIFIED BY TELEPHONE AT (626) 962-8605 SO THAT REQUIRED INSPECTION CAN BE MADE.

PRIVATE CONTRACT SEWER GENERAL NOTES

The following general notes are to be included on Page 1 of all Private Contract Sewer Plans:

1. A sewer construction permit shall be obtained and a fee paid for construction inspection and record plans to the Department of Public Works at the Permit Counter, 900 South Fremont Avenue, 8th Floor, Alhambra, at least 72 hours prior to starting work under this permit. Copies of all other required permits, such as Road Excavation, Caltrans, etc., must be filed with the permit application.
2. Prior to issuance of any permit, the contractor shall file a permit for excavations and trenches from the State of California Division of Industrial Safety, and a Certificate of Worker's Compensation Insurance with the Department of Public Works named as the Certificate Holder. The Department of Public Works shall be notified 30 days prior to cancellation of the insurance policy
3. If work is done in a State Highway, a permit must be obtained from the State of California Division of Highways, 120 South Spring Street, Los Angeles, California.
4. When work is within a contract city, the contractor must contact the Director of Public Works of that city, to determine the location to pay the inspection fee.
5. The contractor shall contact the district office listed on the "Application for Construction Permit" to arrange for an acceptable construction start date.
6. Approval of this plan by the County of Los Angeles does not constitute a representation as to accuracy of the location of or the existence or non-existence of any underground utility pipe or structure within the limits of this project. This note applies to all pages.
7. All work shall be in accordance with the latest approved edition of the "Standard Specifications for Public Works Construction", including supplements and the latest "Special Provisions for the Construction of Sanitary Sewers" and shall be prosecuted only in the presence of the Department of Public Works
8. The contractor's attention is directed to Section 7-10.4.1 of the "Standard Specifications for Public Works Construction" in regard to safety orders and shall conform to the "Minimum Public Safety Requirements" as shown on Los Angeles Department of Public Works' Standard 6008-1.
9. Elevations are in feet above U.S.C. & G.S. sea level datum of 1929.
10. No revisions shall be made in these plans without the approval of the Director of Public Works.
11. No representative of the Department of Public Works will survey or lay out any portion of the work.
12. Grades to which this improvement is to be constructed are shown on plans and profiles. Grade points for top of curbs, centerline of streets, or centerline of alleys, are shown by circles on profiles at all points between said designed points. The grade shall be established so as to conform to a straight line drawn between said designed points.
13. The private engineer shall furnish the Department of Public Works with grade sheets and stationing for all house laterals and "Y" or "T" branches and shall provide stakes for them at their proper locations with stationing plainly marked. All house laterals shall be constructed in a straight alignment at right angles from the main line sewer except as shown on the plans. House laterals from chimneys shall not have an angle of less than 45 degrees with the M.L. sewer. Any change in alignment shall be requested in writing by the private engineer.
14. The private engineer shall furnish the house lateral depth at the property line below the top of curb elevation for each house lateral on the grade sheet.
15. An approved backwater valve is required when the pad is lower in elevation than the top of the next upstream manhole.
16. Contact environmental programs division for industrial waste discharge permit @ (626) 458-3517.

AS BUILT

CONSTRUCTION NOTES

1. Provide survey stakes on the property line or property lines produced at right angles to the sewer line at the centerline of each manhole.
2. Vitrified clay pipe joints shall be type "D" or "G" per "Standard Specifications for Public Works Construction" Section 208-2.
3. If a powerpole is within three feet of the sewer, the sewer shall be encased per LACDPW standard plan 2023-2, case II, two feet on each side from the point of interference.
4. All joints between cast iron pipe and vitrified clay shall be made with a rubber sleeve joint, type "D" (with bushing if necessary) per "Standard Specifications for Public Works Construction" Section 208-2.
5. House laterals to be constructed with inverts at the property line 6 feet below curb grade except as noted.
6. Wye or tee branches may be used for connections to the mainline sewers except as noted.
7. If during the course of construction, it is determined that there is less than four feet of cover over the top of a mainline or house lateral V.C.P. sewer which is not indicated on the plans, the pipes shall be encased per LACDPW standard plan 2023-2, case II, unless otherwise approved by the Director of Public Works.
8. All structures shall be either brick sewer manholes per standard plan LACDPW S-3 (APWA 203-0), or precast concrete sewer manholes per LACDPW standard plan S-38 (APWA 200-2), or reinforced precast concrete manhole per LACDPW standard plan 2003-2, except as noted.
9. Resurface all trenches within paved areas to meet Los Angeles County Department of Public Works or California State Highway requirements in accordance with the permits.
10. Full compliance with section 306-1.3.4. of the "Standard Specification for Public Works Construction" will be required for backfill in street. Certification of backfill, compaction and sand equivalents by a qualified civil engineer shall be provided by the permitee prior to the issuance of a certificate of partial acceptance.
11. All backfill and fills outside of the street right of way shall be compacted to 90% of the maximum density as determined by ASTM soil compaction test D 1557-78 method "D" unless otherwise specified. This shall be certified by a qualified civil engineer. This certification shall be submitted to the Construction Division of the Department of Public Works prior to the acceptance of the work by the county.
12. Manhole tops in unimproved rights of way to be six inches above finished grade.
13. Sewers to be tested for leakage per section 306-1.4 of the standard specifications and special provisions.
14. Manhole tops in improved right of way to be level with finished grade
15. All wyes and/or house laterals are to be located at least 5 ft. apart and when possible not closer than 5 ft. to any manhole.

PAGE 1 ①

PROFILE, ALIGNMENT AND GRADE OF SANITARY SEWERS TO BE CONSTRUCTED IN 18958 DAISETTA ST., ROWLAND HEIGHTS, PC 12046

1 SHEETS: 2 PAGES
INDEX MAP E-2305
COUNTY OF LOS ANGELES, CALIFORNIA

DONALD L. WOLFE DIRECTOR OF PUBLIC WORKS

APPROVED BY: LAND DEVELOPMENT DIVISION

BY ______ 11/20/07
ASSISTANT DIVISION ENGINEER DATE

SUBMITTED BY ______ 11/20/07
SEWER AND WATER / LANDSCAPING SUBDIVISION PLAN CHECKING SECTION DATE

APPROVED: COUNTY SANITATION DISTRICT NO. 21
OF LOS ANGELES COUNTY, CALIFORNIA
STEPHEN R. MAGUIN – CHIEF ENGINEER AND GENERAL MANAGER

BY ______ DATE: 11/28/07
for OFFICE ENGINEER

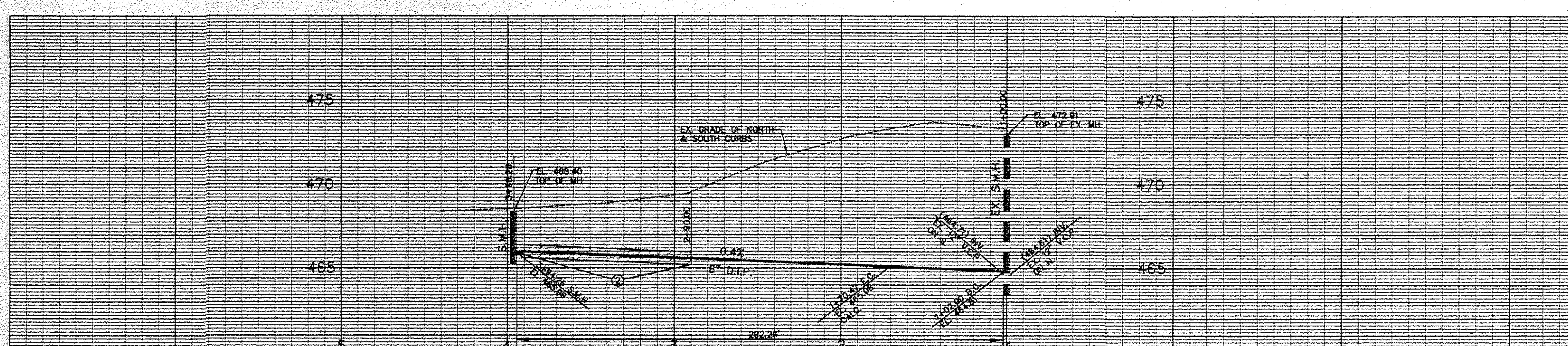
18958 DAISETTA ST, ROWLAND HEIGHTS P.C. 12046

PRIVATE ENGINEERS NOTICE TO CONTRACTORS:

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS IS REQUIRED BY A SEARCH OF AVAILABLE RECORDS TO THE BEST OF OUR KNOWLEDGE. THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THIS MAP. THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THIS DRAWING. PRIOR TO EXCAVATION THE CONTRACTOR SHALL CALL TOLL FREE 1-800-422-4133 TO VERIFY THE UNDERGROUND LOCATION OF GAS AND TELEPHONE LINES. THE CONTRACTOR SHALL ALSO CALL MR. RAY CUMMINGS OF GENERAL TELEPHONE COMPANY AT 1-805-948 4871 SO THAT THEY CAN MARK THE LOCATION OF UNDERGROUND TELEPHONE LINES.

HANK JONG R.C.E. NO. 45846 11/7/07
EXPIRATION DATE: 12-31-2008 DATE

P.C. 12046 PAGE 2



NO L.A. CO. CHARGES FOR CONNECTION

SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES
TEL. (562) 908-4288 EX. 2727

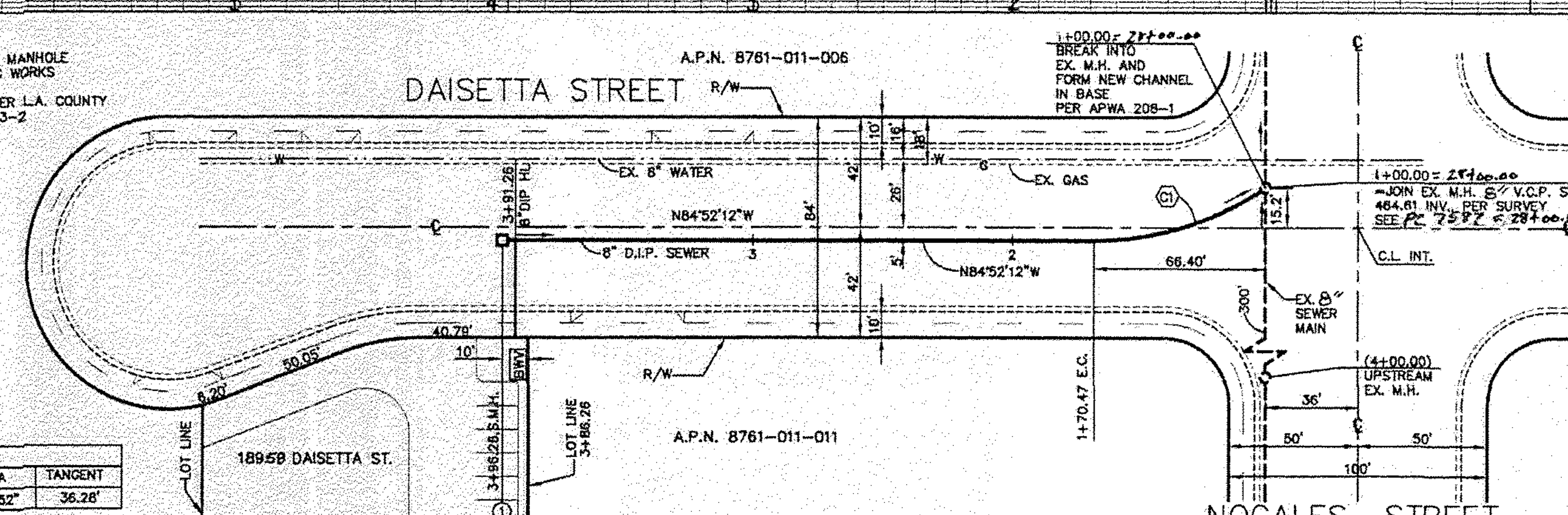
SCALE: VERT. 1"=4'
HORIZ. 1"=40'

CONSTRUCTION NOTES:

① CONSTRUCT PRECAST CONCRETE SHALLOW MANHOLE PER L.A. COUNTY DEPARTMENT OF PUBLIC WORKS STD. 2002-1, SECTION B-B TYPE A.
② CONSTRUCT SEWER MAIN ENCASEMENT PER L.A. COUNTY DEPARTMENT OF PUBLIC WORKS STD. 2023-2 CONCRETE ENCASEMENT.

NOTE:
BWV BACKWATER VALVES MAY REQUIRED FOR BUILDING.

CURVE TABLE				
CURVE	LENGTH	RADIUS	DELTA	TANGENT
C1	70.47'	120.00'	33°38'52"	36.28'



AS BUILT
Accepted 2/18/09

PS007181

PLAN
SCALE: 1" = 40'
25 0 50 100

EGL JOB NO. 07-001-002

REGISTERED PROFESSIONAL ENGINEER
HANK HSING-LIAN JONG
45846
Exp. 12/31/08
CIVIL
STATE OF CALIFORNIA

PROJECT ENGINEER 11/7/07 DATE

NO.	REVISION	REVISED BY	APPROVED BY	DATE

SANITARY SEWER PLANS IN
18958 DAISETTA ST., ROWLAND HEIGHTS, PC NO. 12046

REVIEWED BY LAND DEVELOPMENT DIVISION
BY ______ 11/20/07
SEWER AND WATER / LANDSCAPING SUBDIVISION PLAN CHECKING SECTION
COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

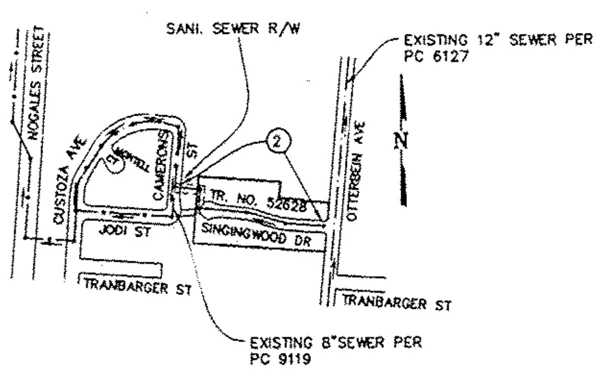
EGL ASSOCIATES, INC.
11819 GOLDRING ROAD, UNIT A
ARCADIA, CA 91006
TEL: (626) 263-3588

BENCH MARKS

BM G-3103 Elev. 511.984

RDBM TAG IN N CB 2M W/O BCR @ N/E COR COLIMA RD & OTTERBEIN AVE, 12.8M N & 15M E/O CL INT

LA HABRA QUAD 1981



NOTE: NUMBER IN CIRCLE INDICATES PAGE NUMBER.

INDEX MAP

SCALE: 1"=600'

P.C. 11500–TR. NO. 52628

THOMAS GUIDE PAGE: 679 C4

INDEX: 2305

NO.	REVISION	REVISED BY	APPROVED BY	DATE

STORMWATER POLLUTION CONTROL REQUIREMENTS FOR SEWER CONSTRUCTION

1. Eroded sediments and other pollutants must be retained on site and may not be transported from the site via sheet flow, swales, area drains, natural drainage courses, or wind.
2. Stockpiles of earth and other construction related materials must be protected from being transported from the site by the forces of wind or water.
3. Fuels, oils, solvents, and other toxic materials must be stored in accordance with their listing and are not to contaminate the soil and surface waters. All approved storage containers are to be protected from the weather. Spills must be cleaned up immediately and disposed of in a proper manner. Spills may not be washed into the drainage system.
4. Excess or waste concrete may not be washed into the public way or any other drainage system. Provisions shall be made to retain concrete wastes on site until they can be disposed of as solid waste.
5. Trash and construction-related solid wastes must be deposited into a covered receptacle to prevent contamination of rainwater and dispersal by wind.
6. Sediments and other materials may not be tracked from the site by vehicle traffic. The construction entrance roadways must be stabilized so as to inhibit sediments from being deposited into the public way. Accidental depositions must be swept up immediately and may not be washed down by rain or other means.
7. Any slopes with disturbed soils or denuded of vegetation must be stabilized so as to inhibit erosion by wind and water.

CA001 – DEWATERING OPERATIONS
CA002 – PAVING OPERATIONS
CA003 – STRUCTURE CONSTRUCTION AND PAINTING
CA010 – MATERIAL DELIVERY AND STORAGE
CA020 – SOLID WASTE MANAGEMENT
CA021 – HAZARDOUS WASTE MANAGEMENT
CA023 – CONCRETE WASTE MANAGEMENT
CA024 – SANITARY/SEPTIC WASTE MANAGEMENT
CA030 – VEHICLE AND EQUIPMENT CLEANING
CA031 – VEHICLE AND EQUIPMENT FUELING
CA032 – VEHICLE AND EQUIPMENT MAINTENANCE
ESC01 – SCHEDULING
ESC02 – PRESERVATION OF EXISTING VEGETATION
ESC10 – SEEDING AND PLANTING
ESC11 – MULCHING
ESC20 – GEOTEXTILES AND MATS
ESC21 – DUST CONTROLS
ESC22 – TEMPORARY STREAM CROSSING
ESC23 – CONSTRUCTION ROAD STABILIZATION
ESC24 – STABILIZED CONSTRUCTION ENTRANCE
ESC54 – STORM DRAIN INLET PROTECTION

STANDARD PLANS:

THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF THE FOLLOWING DEPARTMENT SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

APWA 208-0 BREAKING INTO EXISTING MANHOLES
APWA 222-0 HOUSE CONNECTION SEWER
APWA 223-0 HOUSE CONNECTION REMODELING
2000-0 LEGEND FOR SANITARY SEWER PLANS AND PROFILES AND DISTRICT MAPS.
2021-0 BEDDING FOR SEWER PIPE
2024-0 WYE OR TEE SUPPORT
2027-0 ALLOWABLE TRENCH WIDTHS
2028-0 JACKING STEEL CASING FOR SEWER PIPE

NO CONNECTION FOR DISPOSAL OF INDUSTRIAL WAISTS SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS UNTIL A PERMIT FOR INDUSTRIAL WASTE WATER DISCHARGF HAS BEEN ISSUED BY THE SANITATION DISTRICTS FOR SAID CONNECTION.

BEFORE BREAKING INTO OR CONSTRUCTION ON A COUNTY SANITATION DISTRICT SEWER AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT, A SANITATION DISTRICT INSPECTOR SHALL BE NOTIFIED BY PHONE AT (626)962-8605 SO THAT REQUIRED INSPECTION CAN BE MADE.

PRIVATE CONTRACT SEWER GENERAL NOTES

The following general notes are to be included on Page 1 of all Private Contract Sewer Plans:

1. A sewer construction permit shall be obtained and a fee paid for construction inspection and record plans to the Department of Public Works at the Permit Counter, 900 South Fremont Avenue, 8th Floor, Alhambra, at least 72 hours prior to starting work under this permit. Copies of all other required permits, such as Road Excavation, Caltrans, etc., must be filed with the permit application.
2. Prior to issuance of any permit, the contractor shall file a permit for excavations and trenches from the State of California Division of Industrial Safety, and a Certificate of Worker's Compensation Insurance with the Department of Public Works named as the Certificate Holder to be notified 30 days prior to cancellation of policy.
3. If work is done in a State Highway, a permit must be obtained from the State of California Division of Highways, 120 South Spring Street, Los Angeles, California.
4. When work is within a contract city, the contractor must contact the Director of Public Works of that city, to determine the location to pay the inspection fee.
5. The contractor shall contact the district office listed on the "Application for Construction Permit" to arrange for an acceptable construction start date.
6. Approval of this plan by the County of Los Angeles [illegible] not constitute a representation as to accuracy of the location of or the existence or non-existence [illegible] any underground utility pipe or structure within the limits of this project. This note applies to all pa[illegible]
7. All work shall be in accordance with the latest approved edition of the "Standard Specifications for Public Works Construction, including supplements and the latest Special Provisions for the Construction of Sanitary Sewers and shall be prosecuted only in the presence of the Department of Public Works
8. The contractor's attention is directed to Section 7-10.4.1 of the Standard Specifications for Public Works Construction in regard to safety orders and shall conform to the "Minimum Public Safety Requirements" as shown on Los Angeles Department of Public Works' Standard S-2.
9. Elevations are in feet above U.S.C. & G.S. sea level datum of 1929.
10. No revisions shall be made in these plans without the approval of the Director of Public Works.
11. No representative of the Department of Public Works will survey or lay out any portion of the work.
12. Grades to which this improvement is to be constructed are shown on plans and profiles. Grade points for top of curbs, centerline of streets, or centerline of alleys, are shown by circles on profiles at all points between designated points. The grade shall be established so as to conform to a straight line drawn between said designated points.
13. The private engineer shall furnish the Department of Public Works with grade sheets and stationing for all house laterals and "Y" or "T" branches and shall provide stakes for them at their proper locations with stationing plainly marked. All house laterals shall be constructed in a straight alignment at right angles from the main line sewer except as shown on the plans. House laterals from chimneys shall not have an angle of less than 45 degrees with the M.L. sewer. Any change in alignment shall be requested in writing by the private engineer.
14. The private engineer shall furnish the house lateral depth at the property line below the top of curb elevation for each house lateral on the grade sheet.

CONSTRUCTION NOTES

1. Provide survey stakes on the property line or property lines produced at right angles to the sewer line at the centerline of each manhole
2. Vitrified clay pipe joints shall be type "D" or "G" per standard specifications section 208-2.
3. If a powerpole is within three feet of the sewer, the sewer shall be encased per standard plan S-23, case II, two feet on each side from the point of interference.
4. All joints between cast iron pipe and vitrified clay shall be made with a rubber sleeve joint, type "D" (with bushing if necessary) per standard specifications section 208-2.
5. House laterals to be constructed with inverts at the property line 6 feet below curb grade except as noted.
6. Wye or tee branches may be used for connections to the mainline sewers except as noted.
7. If during the course of construction, it is determined that there is less than four feet of cover over the top of a mainline or house lateral V.C.P. sewer which is not indicated on the plans, the pipes shall be encased per standard plan S-23, case II, unless otherwise approved by the director of Public Works.
8. All structures shall be either brick sewer manholes per standard plan S-3 or precast concrete sewer manholes per standard plan S-36, or reinforced precast concrete manhole per standard plan S-6, except as noted.
9. resurface all trenches within paved areas to meet Los Angeles County Public Works or California State Highway requirements in accordance with the permits.
10. Full compliance with section 306-1.3.4. of the standard specification will be required for backfill in street certification of backfill compaction and sand equivalents by a qualified civil engineer shall be provided by the permitee prior to the issuance of a certificate of partial acceptance.
11. All backfill and fills outside of the street right of way shall be compacted to 90% of the maximum density as determined by ASTM soil compaction test D 1557-78 method "D" unless otherwise specified. This shall be certified by a qualified civil engineer. This certification shall be submitted to the Construction Division of the Department of Public Works prior to the acceptance of the work by the county.
12. Manhole tops in unimproved rights of way to be six inches above finished grade.
13. Sewers to be tested for leakage per section 306-1/4 of the standard specifications and special provisions.

PAGE 1

PROFILE, ALIGNMENT AND GRADE OF SANITARY SEWERS

TO BE CONSTRUCTED IN

TRACT NO. 52628 INDEX: 2305 PC NO. 11500

1 SHEETS: 2 PAGES

COUNTY OF LOS ANGELES CALIFORNIA

HARRY W. STONE DIRECTOR OF PUBLIC WORKS

APPROVED: LAND DEVELOPMENT DIVISION

BY Ronald W. Ondeczek 6-21-00
ASSISTANT DIVISION ENGINEER DATE

SUBMITTED BY [signature] 6-20-00
SUBDIVISION PLAN CHECKING SECTION DATE

55792

APPROVED: COUNTY SANITATION DISTRICT
OF LOS ANGELES CALIF.
CHARLES W. CARRY – CHIEF ENGINEER and GENERAL MANAGER

COUNTY SANITATION DISTRICT NO. 21

BY Charles O. Rylee DATE: 6/22/00
OFFICE ENGINEER

PRIVATE ENGINEERS NOTICE TO CONTRACTORS:

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS IS REQUIRED BY A SEARCH OF AVAILABLE RECORDS TO THE BEST OF OUR KNOWLEDGE. THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THIS MAP. THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THIS DRAWING. PRIOR TO EXCAVATION THE CONTRACTOR SHALL CALL TOLL FREE 1-800-422-4133 TO VERIFY THE UNDERGROUND LOCATION OF GAS AND TELEPHONE LINES. THE CONTRACTOR SHALL ALSO CALL MR. RAY CUMMINGS OF GENERAL TELEPHONE COMPANY AT 1-805-948 4871 SO THAT THEY CAN MARK THE LOCATION OF UNDERGROUND TELEPHONE LINES.

Jens Thielmann 25742 4-27-00
RCE NO DATE

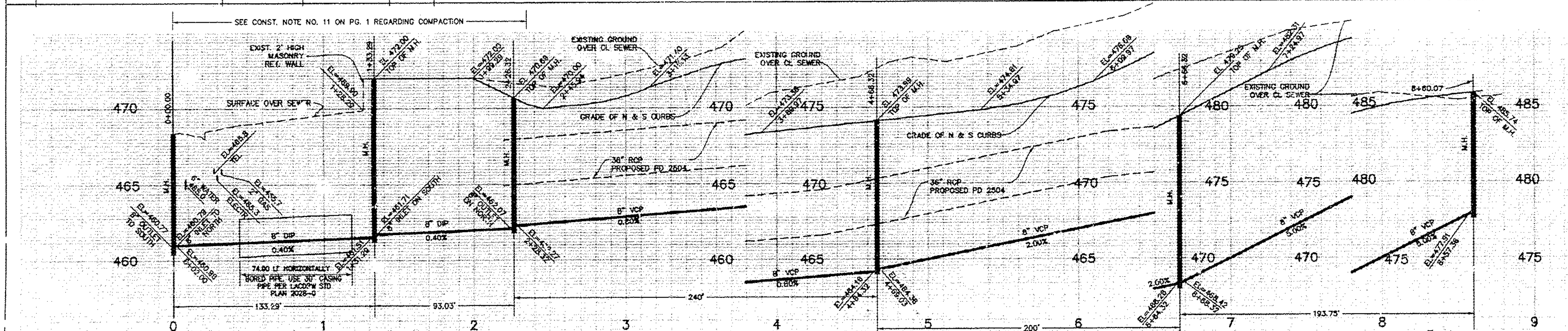
P.C. No 11500 TRACT No 52628

P.C. 11500 PAGE 2

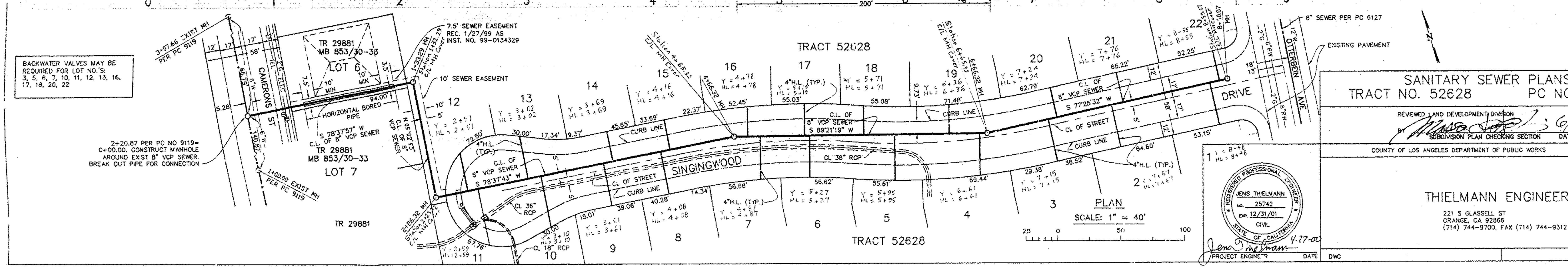
NO LA Co CHARGES FOR CONNECTION

SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES

TEL. (562) 699-7411 EX. 2727



BACKWATER VALVES MAY BE REQUIRED FOR LOT NO.'S: 3, 5, 6, 7, 10, 11, 12, 13, 16, 17, 18, 20, 22



55793

SANITARY SEWER PLANS IN
TRACT NO. 52628 PC NO. 11500

REVIEWED LAND DEVELOPMENT DIVISION
BY [signature] 6/20/00
SUBDIVISION PLAN CHECKING SECTION DATE

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

REGISTERED PROFESSIONAL ENGINEER
JENS THIELMANN
NO. 25742
EXP. 12/31/01
CIVIL
STATE OF CALIFORNIA

Jens Thielmann 4-27-00
PROJECT ENGINEER DATE

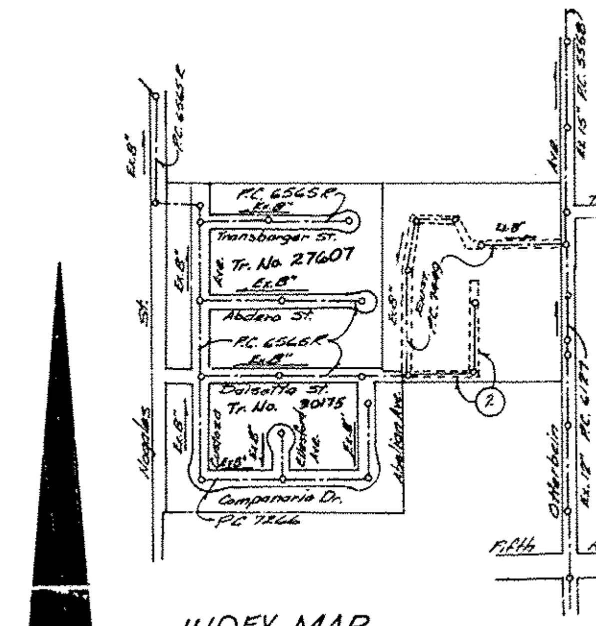
THIELMANN ENGINEERS

221 S GLASSELL ST
ORANGE, CA 92866
(714) 744-9700, FAX (714) 744-9312

DWG

Indatti 5/97

B.M. CG 1295 ELEV. 485.936
L+BN W CB OTTERBEIN AVE
10FT W C/L + 10FT N C/L PROD
TRANBARGER ST.
OTTERBEIN QUAD. 1975



INDEX MAP
Scale 1"=400'
P.C. 9630

NO CONNECTION FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL [illegible] TO SEWERS SHOWN ON THESE [illegible] A [illegible] WASTE WATER [illegible] ISSUED BY THE SANITATION DISTRICTS [illegible] CONNECTION

BEFORE BREAKING INTO OR CONSTRUCTION ON A COUNTY [illegible] PRIOR TO FINAL ACCEPTANCE [illegible] SHALL BE [illegible] PHONE [illegible] REQUIRED INSPECTION CAN [illegible]

GENERAL NOTES:

1. ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.
2. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
3. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
4. GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
5. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND "Y" OR "T" BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
6. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
7. BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L.A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 1, AND PAY A FEE TO THE COUNTY ENGINEER, 201 E. Bonita Ave., San Dimas REGIONAL OFFICE, TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
8. IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.
9. APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
10. REFER TO SECTION 7-10.4.1 OF THE STANDARD SPECIFICATIONS, REGARDING SAFETY ORDERS.
11. PRIOR TO THE ISSUANCE OF THE REQUIRED SEWER CONSTRUCTION PERMIT BY THE COUNTY ENGINEER, THE CONTRACTOR SHALL OBTAIN A PERMIT TO EXCAVATE, FROM THE STATE OF CALIFORNIA, DIVISION OF INDUSTRIAL SAFETY, AND SHALL FILE A CERTIFICATE OF WORKERS COMPENSATION INSURANCE WITH THE COUNTY ENGINEER.

CONSTRUCTION NOTES:

1. WORK SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (1974 EDITION AND COUNTY ENGINEER SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWERS DATED SEPTEMBER 21, 1976 AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.
2. THE CONTRACTOR SHALL NOTIFY THE ENVIRONMENTAL DEVELOPMENT DIVISION, PHONE (213) 974-7283, AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
3. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE EXCEPT AS NOTED.
4. WYE OR TEE BRANCHES MAY BE USED FOR CONNECTIONS TO MAINLINE SEWERS EXCEPT AS NOTED.
5. ALL STRUCTURES SHALL BE EITHER BRICK MANHOLES PER S-3 OR PRECAST CONCRETE MANHOLES PER S-36, EXCEPT AS NOTED.
6. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
7. MANHOLE TOPS IN UNIMPROVED RIGHTS OF WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
8. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "D", "F", OR "G" PER STANDARD SPECIFICATIONS SECTION 208-2.
9. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-23, CASE II, TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE.
10. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-23, CASE II UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
11. ALL JOINTS BETWEEN CAST IRON PIPE AND VITRIFIED CLAY PIPE SHALL BE MADE WITH A RUBBER SLEEVE JOINT, TYPE "C" OR "D", (WITH BUSHING IF NECESSARY) PER STANDARD SPECIFICATIONS, SECTION 208-2.
12. SEWERS TO BE TESTED FOR LEAKAGE PER SECTION 306-1.4 OF THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
13. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
14. FULL COMPLIANCE WITH SECTION 306-1.3.5 OF THE SPECIAL PROVISIONS WILL BE REQUIRED FOR BACKFILL IN STREETS. CERTIFICATION OF BACKFILL COMPACTION AND SAND EQUIVALENTS BY A QUALIFIED, REGISTERED TESTING LABORATORY SHALL BE PROVIDED BY THE PERMITTEE PRIOR TO THE ISSUANCE OF A CERTIFICATE OF PARTIAL ACCEPTANCE.
15. SPECIAL BACKFILL IN DESIGNATED AREA:
(A) BACKFILL TRENCH AND REPLACE OTHER EARTH REMOVED SO AS TO ACHIEVE THE NATURAL OR FINISHED GRADES SHOWN ON THE GRADING PLAN APPROVED FOR THIS TRACT BY THE BUILDING AND SAFETY DIVISION.
(B) ALL EARTH BACKFILL SHALL BE COMPACTED TO MINIMUM OF 90% OF MAXIMUM DENSITY PER A.S.T.M. STANDARD METHOD OF TESTING D698-57T AS MODIFIED. ACCEPTABLE CERTIFICATION OF SUCH COMPACTION SHALL BE SUBMITTED TO THE ENVIRONMENTAL DEVELOPMENT DIVISION.

PROFILE, ALIGNMENT AND GRADE OF

PAGE 1

SANITARY SEWERS

TO BE CONSTRUCTED IN

DAISETTA STREET EXTENSION
PRIVATE CONTRACT NO. 9630

W.S. 38-D4

1 SHEET ; 2 PAGES

47042

SCALE: VERT. 1"—4' HORIZ. 1"—40' JANUARY, 1979

PREPARED IN THE OFFICES OF
ANACAL ENGINEERING CO.
222 E. Lincoln Ave., Anaheim, Calif. 92805 Phone (714)774-1763

BY: [signature]
REG. C. E. No. 8427

THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF THE COUNTY ENGINEER SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT:

LEGEND	S-1
MINIMUM PUBLIC SAFETY REQUIREMENTS	S-2
BRICK MANHOLE	S-3
STANDARD MANHOLE STEP	S-17
BEDDING FOR SEWER PIPE	S-21
CRADLING AND ENCASEMENT	S-23
WYE OR TEE SUPPORT	S-26
ALLOWABLE TRENCH WIDTHS	S-33
LOCKING MANHOLE FRAME AND COVER	S-35
NON-REINFORCED PRECAST CONCRETE MANHOLE	S-36

COUNTY OF LOS ANGELES, CALIFORNIA

STEPHEN J. KOONCE, COUNTY ENGINEER — WALTER E. GARRISON, CHIEF ENGINEER

CO. SAN DIST. NO. 21

APPROVED Sam H. Miller 2/27/79 REGIONAL ENGINEER (DATE) — APPROVED [signature] ASST. OFFICE ENGINEER

CHECKED [signature] 3-1-79 (DATE)

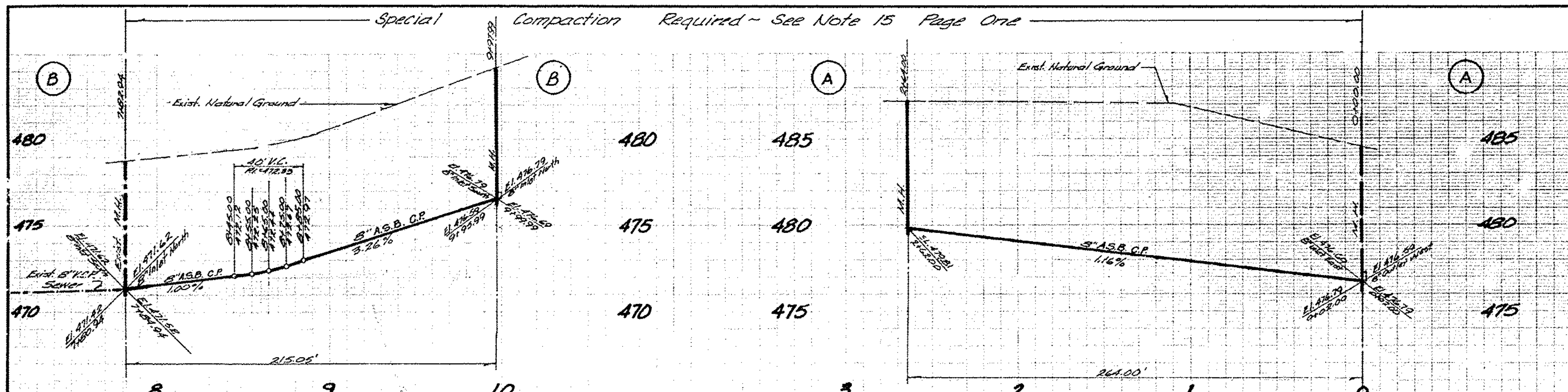
REG. C.E. NO. 10653

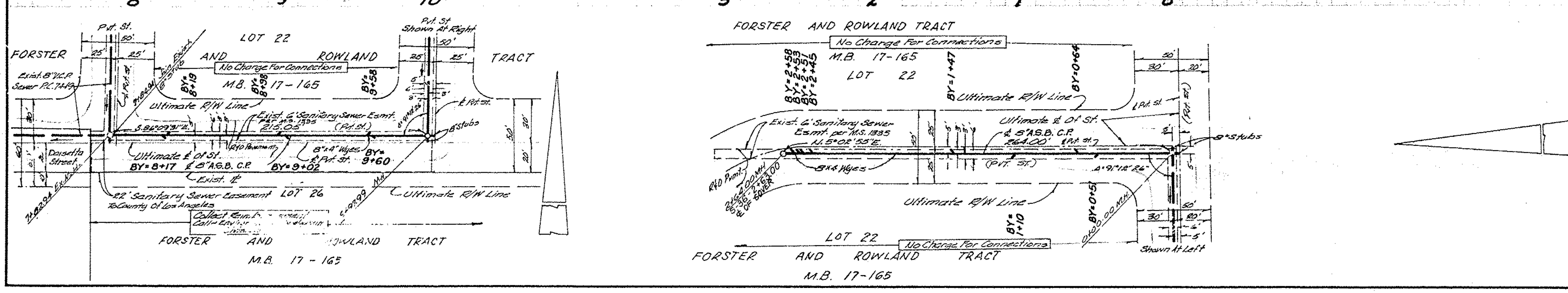
La Puente BLDG. DIST. 20 — J.N. 0358.01

P. C. 9630 PAGE 2

COLLECT CHARGES AS INDICATED

47043





PC 9630

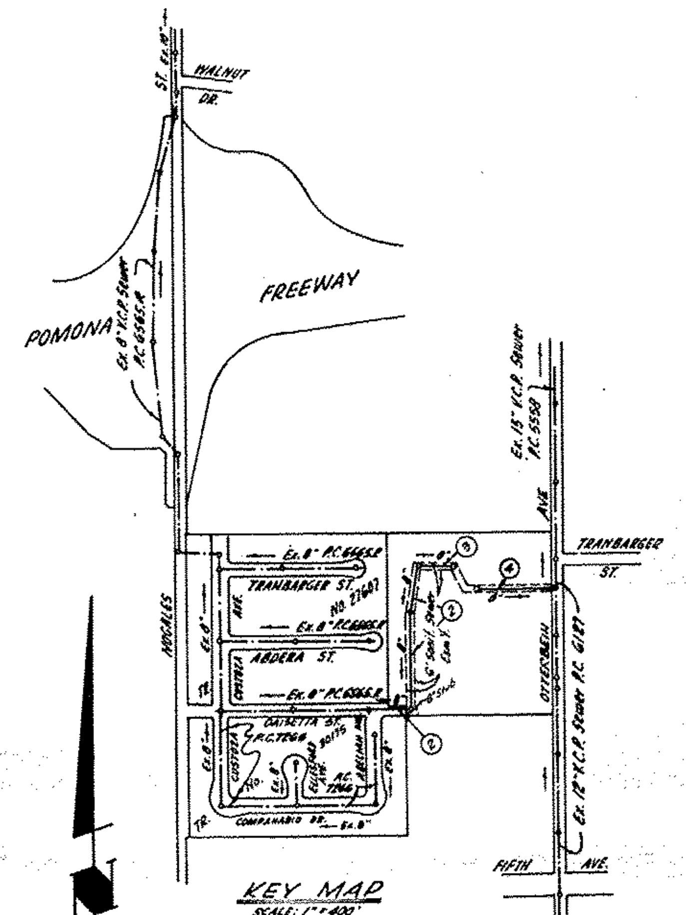
DAISETTA STREET EXTENSION

B.M. S.G. 1294 ELEV. 499.459

L.&T. in Southeast corner of concrete porch in front of house #1529, 451 feet west of ℄ Otterbein Avenue.

OTTERBEIN QUAD. 1955

CONSTRUCTION NOTE:
The 1965 adjustment of this Bench Mark (Elev. 499.433) is shown hereon for reference only. The 1955 adjustment of 499.459 shall be used for all construction per these plans.



REVISION 5/9/67
Deleted Page 2B between Sta. 7+82.94 and 9+97.99 and Page 3A. 5-9-67
APPROVED:
Office of County Engineer R.E. 10443

LA PUENTE BLDG. DIST. NO. 2

NOTES:

1. PROVIDE STAKES ON THE EASEMENT LINE OR EASEMENT LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
2. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
3. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL Y BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ANY CHANGE IN LOCATION SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
4. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
5. USE STANDARD MANHOLE FRAMES AND COVERS, PER S-15
6. USE EXTRA STRENGTH PIPE. ALL PIPE IS STANDARD DEPTH EXCEPT AS NOTED.
7. USE MECHANICAL COMPRESSION JOINTS FOR ALL V.C.P. JOINTS PER SPEC'S., SECS. 36 & 48.
8. RESURFACE ALL TRENCH WITHIN PAVED AREA TO MEET L.A. COUNTY ROAD DEPT. OR CALIF. STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
9. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-23, TWO FEET ON BOTH SIDES FROM THE POINT OF INTERFERENCE.
10. MANHOLES SHALL BE BRICK SEWER STRUCTURES, S-3. PRECAST CONCRETE MANHOLES PER S-5 OR S-6 MAY BE USED AS AN ALTERNATE IN LOCATIONS APPROVED BY THE COUNTY ENGINEER.
11. FOR ALLOWABLE LEAKAGE TEST USE FORMULA NO. 2 SPEC'S., SEC. 64.
12. MANHOLE TOPS IN UNIMPROVED RIGHTS-OF-WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
13. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE, MADISON 9-4747, EXT. 81551 AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
14. ALL STATE AND LOCAL TRENCH SAFETY ORDERS WILL BE RIGIDLY ENFORCED.
15. IF, DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-23 UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
16. THE CONTRACTOR SHALL RESURFACE TRENCH IN IMPROVED PRIVATE STREETS WITH A.C. PAVEMENT ONE INCH GREATER IN THICKNESS THAN EXISTING A.C. PAVEMENT.

COLLECT CHARGES AS INDICATED
John C. Donahie 11-23-65

NO CONNECTIONS FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS WITHOUT WRITTEN PERMISSION FROM THE CHIEF ENGINEER AND GENERAL MANAGER OF THE COUNTY SANITATION DISTRICTS.

ENGINEER'S NOTE TO CONTRACTOR

Private and Public Utilities if shown hereon reflect available record data. The Contractor shall be responsible for locating ALL lines affecting this work and for any damage or protection to these lines.

The contractor shall notify all utility companies having underground facilities affecting this project before excavation is started, so that they may mark or stake their lines.

PROFILE ALIGNMENT AND GRADE OF P.C. 7449

SANITARY SEWERS PAGE 1

CONSTRUCTED IN

SANITARY SEWER R/W

PRIVATE CONTRACT NO. 7449

W.S. 38

2 SHEETS; 4 PAGES

37964

SCALE: VERT. 1" — 4' HORIZ. 1" — 40' SEPTEMBER, 1965

PREPARED IN THE OFFICES OF:

McDANIEL ENGINEERING CO.
222 E. LINCOLN AVE., ANAHEIM - PHONE (714) 774-1763

By: [signature] 9-3-65
REG. C. E. NO. 9808

FOR LEGEND SEE PLAN NO. S-1

NOTE:

GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.

ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929, DATED MAY 25, 1962 as revised

THIS DRAWING AND THE DATA HEREON ARE HEREBY MADE A PART OF THE SPECIFICATIONS.

WORK SHALL BE CONSTRUCTED ACCORDING TO SPECIFICATIONS ON FILE IN THE OFFICE OF THE COUNTY ENGINEER AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.

BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L. A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 1 AND PAY A FEE TO THE COUNTY ENGINEER, ROOM 880 COUNTY ENGINEERING BLDG., 108 W. 2nd St., OR TO THE SAN DIMAS REGIONAL OFFICE, SUFFICIENT TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.

APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.

IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET.

COUNTY OF LOS ANGELES, CALIFORNIA

APPROVED, JOHN A. LAMBIE, COUNTY ENGINEER APPROVED, J.D. PARKHURST, CHIEF ENGINEER

CO. SAN. DIST. NO. 21

BY [signature] ASST. SANITATION ENGINEER BY [signature] OFFICE ENGINEER

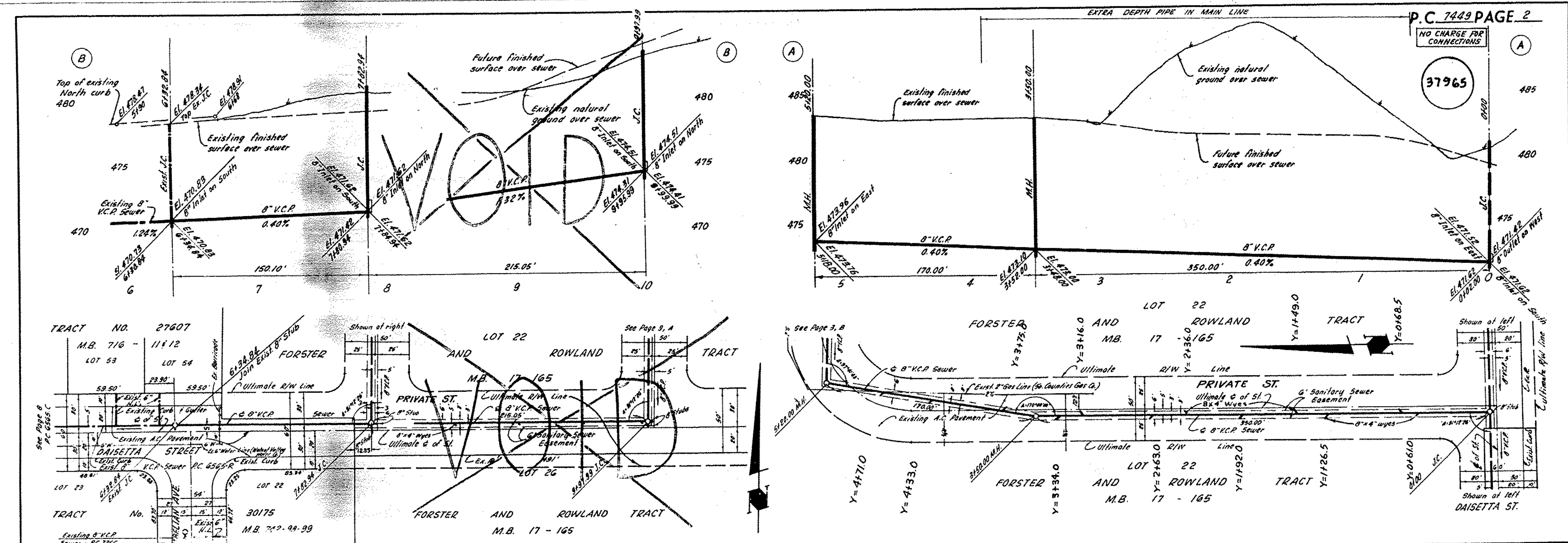
CHECKED BY [signature] 1-7-66
OFFICE OF COUNTY ENGINEER, REG. C. E. NO. 10443

SUBMITTED: [signature]
FOR SAN DIMAS REGIONAL ENGINEER

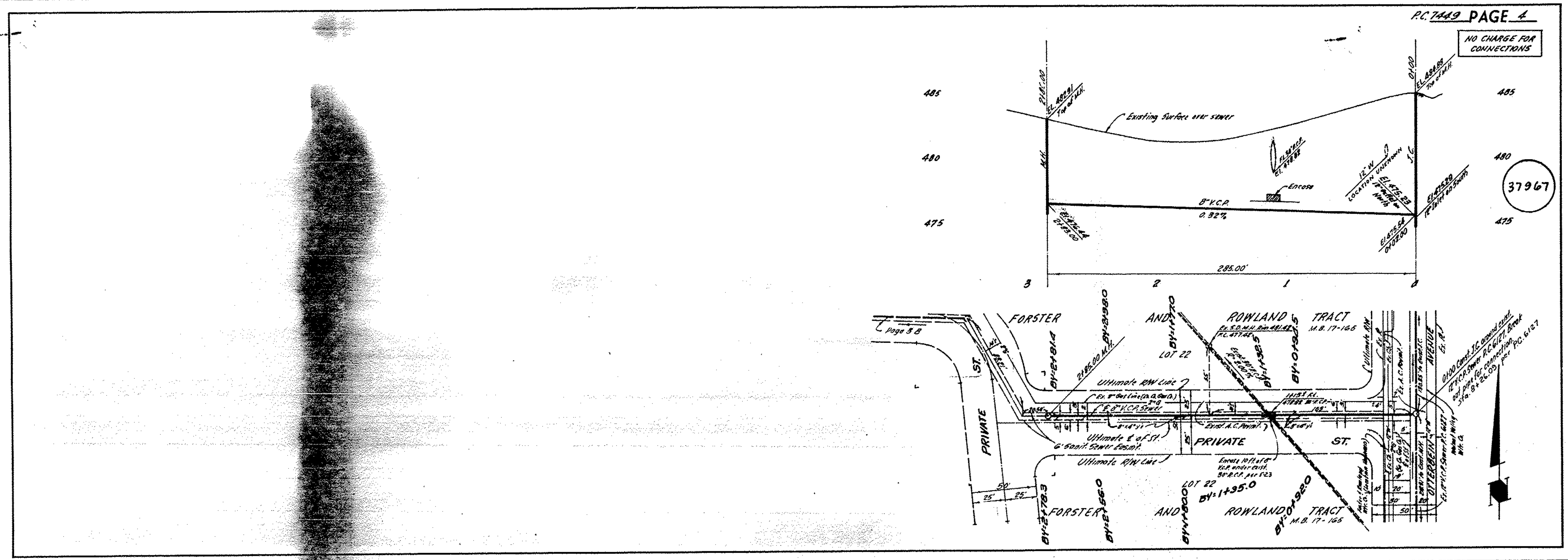
J.N. 0366.29

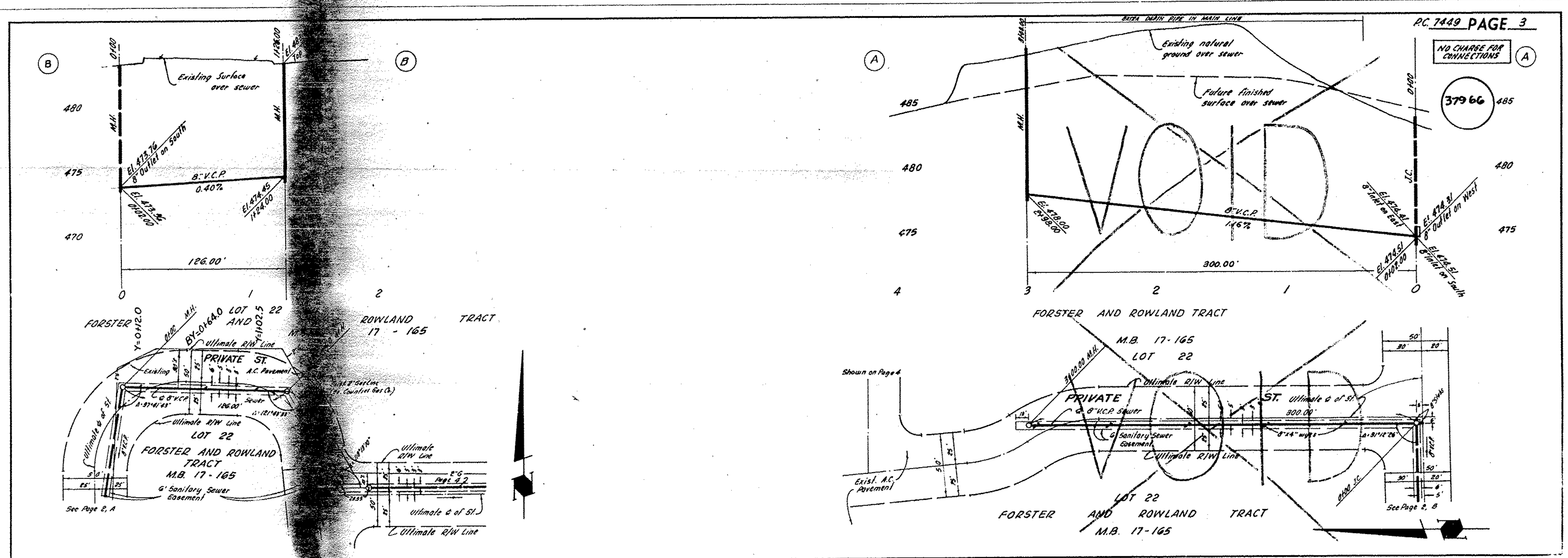
Cal. Baker Home - L.A. Co. 18 - D.K.P.

P.C. 7449 PAGE 2

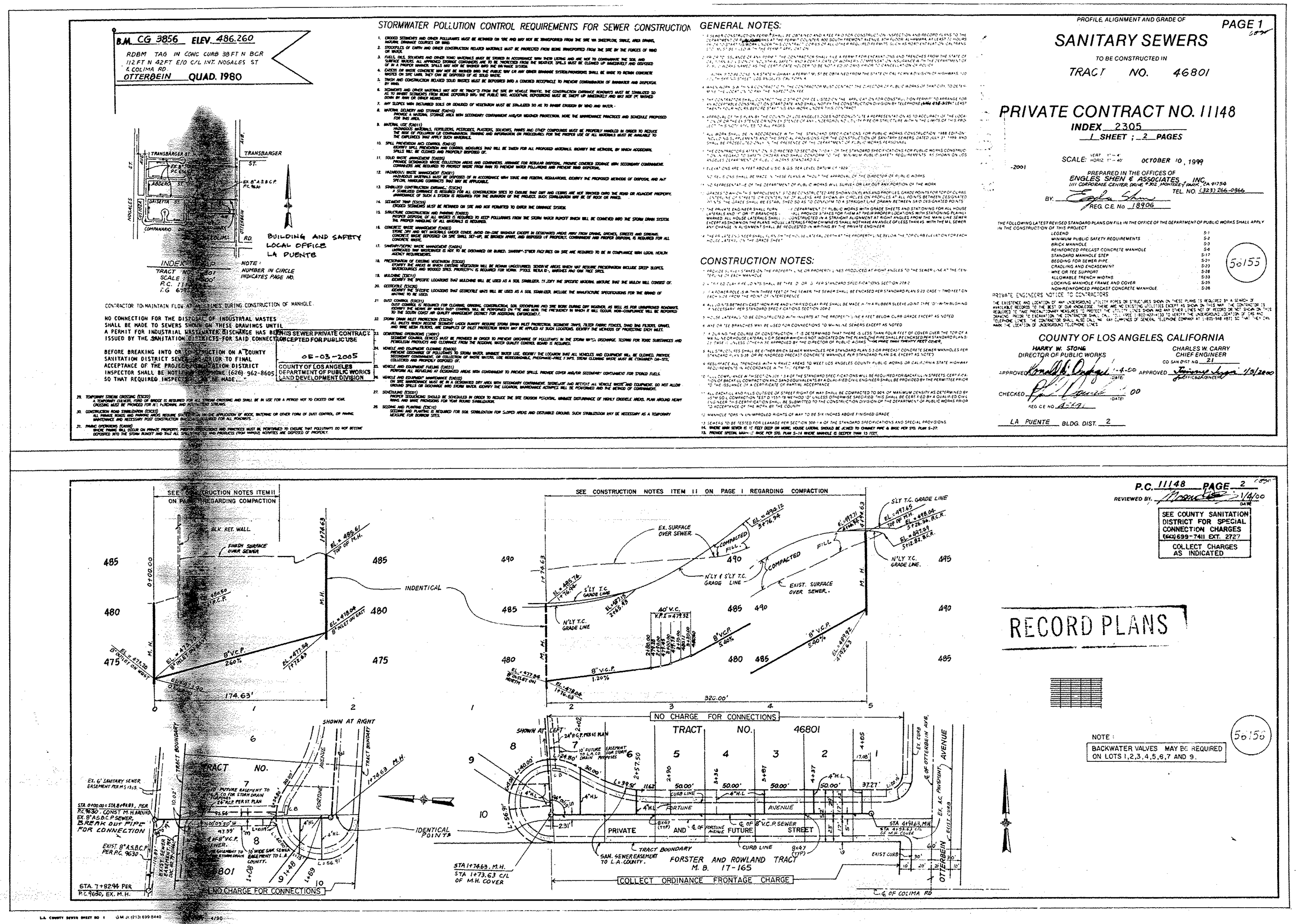


Col. Baker Home - L.A. Co. 18 - D.K.P.





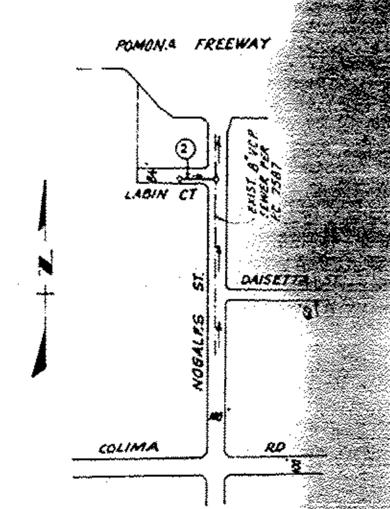
Col Baker Home - L.A. Co



PC 11148

TR. NO. 46801

B.M. C.G. 3836 ELEV. 486.260
RDBM TAG IN CONC C.B. 38 FT
Y BCR 112 FT N & 42 FT E/O
C/L INT COLIMA RD. & NOGALES ST.
OTTERBEIN QUAD. 19 80



NOTE: NUMBER IN CIRCLE INDICATES PAGE NUMBER

INDEX MAP
PC. 10895, LADIN CT.
SCALE: 1" = 600'

NO CONNECTION FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS UNTIL A PERMIT FOR INDUSTRIAL WASTEWATER DISCHARGE HAS BEEN ISSUED BY THE SANITATION DISTRICTS FOR SAID CONNECTION.

BEFORE BREAKING INTO OR CONSTRUCTION ON A COUNTY SANITATION DISTRICT SEWER AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT, SANITATION DISTRICT INSPECTOR SHALL BE NOTIFIED BY PHONE (818) 962-8505 SO THAT REQUIRED INSPECTION CAN BE MADE.

GENERAL NOTES:

1. ELEVATIONS ARE IN FEET FROM U.S.C.&G.S. SEA LEVEL DATUM OF 1929.
2. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE DIRECTOR OF PUBLIC WORKS.
3. NO REPRESENTATIVE OF THE DEPARTMENT OF PUBLIC WORKS WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
4. GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTERLINE OF STREETS OR CENTERLINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
5. THE PRIVATE ENGINEER SHALL FURNISH THE DEPARTMENT OF PUBLIC WORKS WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND [illegible] BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATION NO. PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAINLINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAINLINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
6. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
7. BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE CONSTRUCTION DIVISION OF THE LOS ANGELES DEPARTMENT OF PUBLIC WORKS, PERMIT OFFICE NO.6, AND PAY A FEE TO THE DIRECTOR OF PUBLIC WORKS, 900 S. FREEMONT AVE., ALHAMBRA, CALIFORNIA 91803 — 8TH FLOOR, TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
8. IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.
9. APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
10. REFER TO SECTION [illegible] OF THE STANDARD SPECIFICATIONS [illegible] SAFETY ORDERS.
11. PRIOR TO THE ISSUANCE OF THE REQUIRED SEWER CONSTRUCTION PERMIT, THE CONTRACTOR SHALL OBTAIN AND FILE WITH THE DEPARTMENT OF PUBLIC WORKS COPIES OF A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE CONSTRUCTION DIVISION OF THE DEPARTMENT OF PUBLIC WORKS, A PERMIT FOR EXCAVATIONS AND TRENCHES FROM THE STATE OF CALIFORNIA, A DIVISION OF INDUSTRIAL SAFETY AND A CERTIFICATE OF WORKER'S COMPENSATION INSURANCE WITH THE DEPARTMENT OF PUBLIC WORKS, 900 S. FREEMONT AVE., ALHAMBRA, CALIFORNIA 91803 — 8TH FLOOR, NAMED AS THE CERTIFICATE HOLDER TO BE NOTIFIED 30 DAYS PRIOR TO CANCELLATION OF POLICY.

CONSTRUCTION NOTES:

1. WORK SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1985 EDITION WITH 1986 SUPPLEMENTS, AND DEPARTMENT OF PUBLIC WORKS SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWERS DATED SEPTEMBER 21, 1978 AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE DEPARTMENT OF PUBLIC WORKS.
2. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE [illegible] AT LEAST TWENTY FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
3. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE EXCEPT AS NOTED.
4. WYE OR TEE BRANCHES MAY BE USED FOR CONNECTIONS TO MAINLINE SEWERS EXCEPT AS NOTED.
5. ALL STRUCTURES SHALL BE EITHER BRICK SEWER MANHOLES PER S-3 OR PRECAST CONCRETE SEWER MANHOLES PER [illegible] EXCEPT AS NOTED.
6. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER [illegible] EACH MANHOLE.
7. MANHOLE TOPS IN UNIMPROVED RIGHTS OF WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
8. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE [illegible] OF THE STANDARD SPECIFICATIONS SECTION [illegible]
9. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED PER S-23 CASE [illegible] POINT OF INTERFERENCE.
10. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAINLINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-23, CASE [illegible] UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF PUBLIC WORKS.
11. ALL JOINTS BETWEEN CAST IRON PIPE AND VITRIFIED CLAY PIPE SHALL BE MADE WITH A RUBBER SLEEVE JOINT [illegible] WITH BUSHING IF NECESSARY PER STANDARD SPECIFICATIONS, SECTION 208-2.
12. SEWERS TO BE TESTED FOR LEAKAGE PER SECTION 306-1.4 OF THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
13. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET LOS ANGELES COUNTY PUBLIC WORKS OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
14. FULL COMPLIANCE WITH SECTION 306-1.3.4 OF THE STANDARD SPECIFICATIONS WILL BE REQUIRED FOR BACKFILL IN STREETS. CERTIFICATION OF BACKFILL COMPACTION AND SAND EQUIVALENTS BY A QUALIFIED REGISTERED TESTING LABORATORY SHALL BE PROVIDED BY THE PERMITTEE PRIOR TO THE ISSUANCE OF A CERTIFICATE OF PARTIAL ACCEPTANCE.
15. SPECIAL BACKFILL IN EASEMENT CONSTRUCTION: (A) BACKFILL TRENCH AND REPLACE OTHER EARTH SO AS TO ACHIEVE THE NATURAL OR FINISHED GRADES AND SLOPES SHOWN ON THE GRADING PLAN APPROVED FOR THIS DEVELOPMENT BY THE LAND DEVELOPMENT DIVISION. (B) ALL BACKFILL AND EARTH REPLACED SHALL BE COMPACTED TO A MINIMUM OF 90% OF MAXIMUM DENSITY PER A.S.T.M. STD. METHOD OF TEST D698 57T AS MODIFIED. ACCEPTABLE CERTIFICATION OF SUCH COMPACTION SHALL BE SUBMITTED TO THE CONSTRUCTION DIVISION PUBLIC WORKS DEPARTMENT.

PROFILE, ALIGNMENT AND GRADE OF

PAGE 1

SANITARY SEWERS

TO BE CONSTRUCTED IN

LABIN COURT

PRIVATE CONTRACT NO. 10895

INDEX-U-130

1 SHEET ; 2 PAGES

52709

REGISTERED PROFESSIONAL ENGINEER JAMES P. SCHILKE No. 43265 EXP. 3/31/92 CIVIL STATE OF CALIFORNIA

SCALE: [illegible]

MAY 16, 1988

PREPARED IN THE OFFICES OF
TAIT & ASSOCIATES, INC.
800 N. ECKHOFF ST., ORANGE, CA 92613
(714) 634-4800
BY [signature]
REG. C.E. No. 43265

[illegible]

LEGEND	S-1
MINIMUM PUBLIC SAFETY REQUIREMENTS	S-2
STANDARD MANHOLE [illegible]	[illegible]
BEDDING FOR SEWER PIPE	S-21
CRADLING AND ENCASEMENT	S-23
WYE OR TEE SUPPORT	S-24
ALLOWABLE TRENCH WIDTHS	S-33
EXISTING MANHOLE FRAME AND COVER	S-35
NON-REINFORCED PRECAST CONCRETE MANHOLE	S-36

COUNTY OF LOS ANGELES, CALIFORNIA

THOMAS A. TIDEMANSON
DIRECTOR OF PUBLIC WORKS

CHARLES W. CARRY
CHIEF ENGINEER
CO. SAN. DIST. NO. 21

APPROVED Dean Efstathiou 9-6-88 DATE

APPROVED for [signature] CHIEF ENGINEER 7/9/88

CHECKED [signature] 9-1-88 DATE

REG. C.E. NO. 18,116

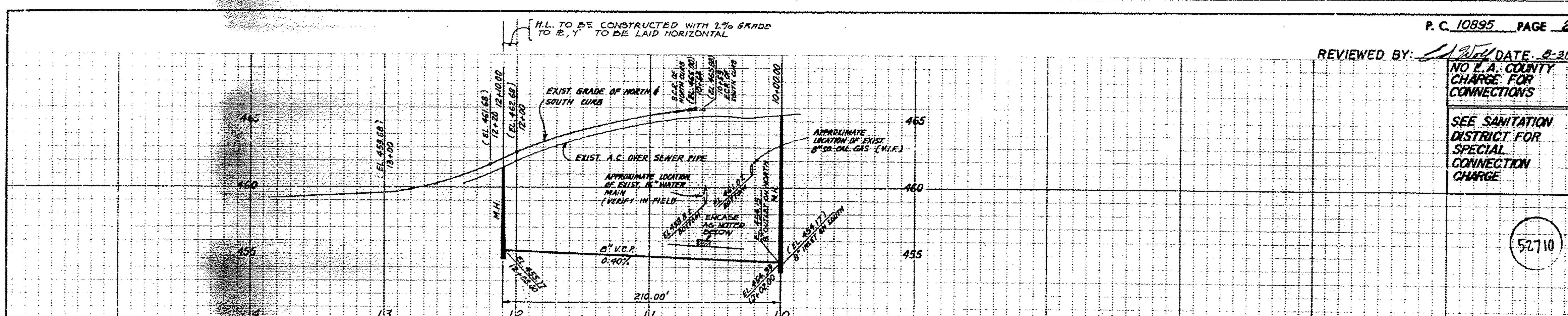
LA PUENTE BLDG. DIST. 2

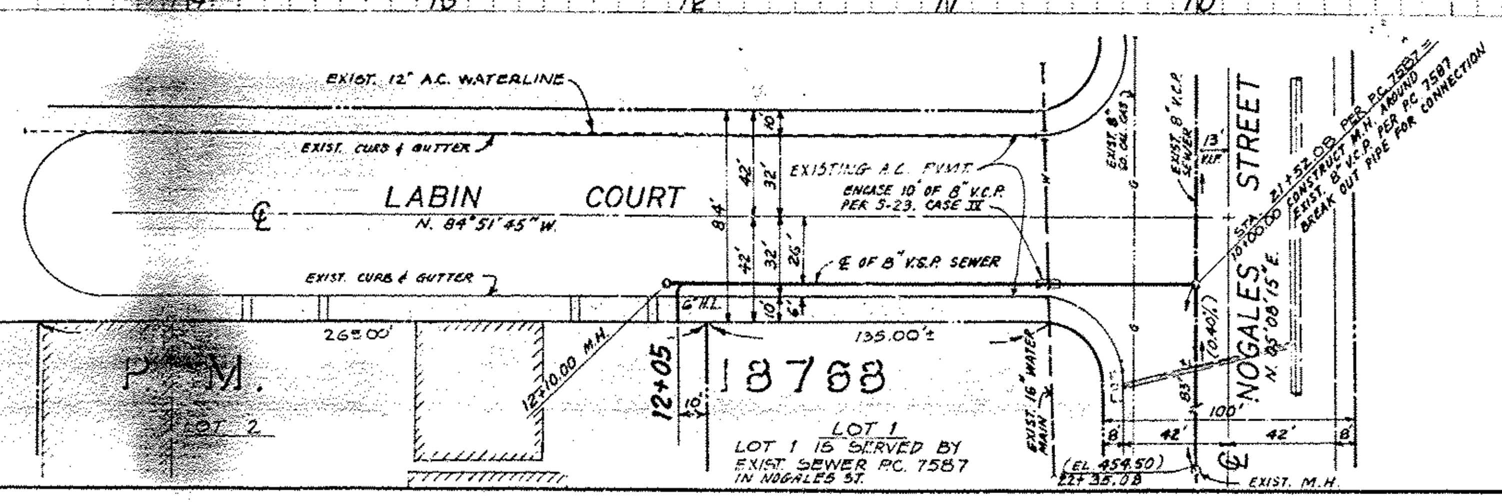
P. C. 10895 PAGE 2

REVIEWED BY: [signature] DATE: 8-31-88

NO L.A. COUNTY CHARGE FOR CONNECTIONS

SEE SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGE

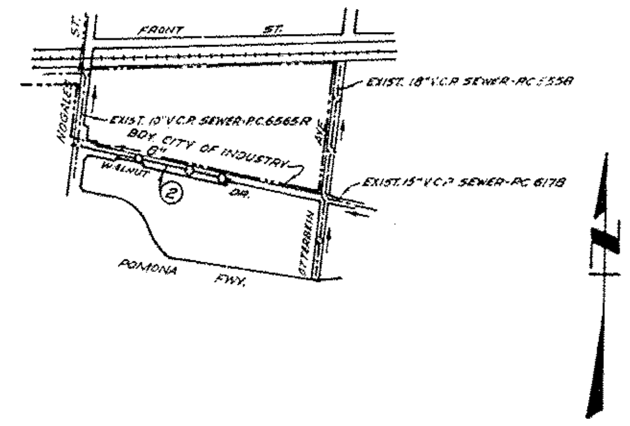




NOTE: BACKWATER VALVE MAY BE REQUIRED.

LABIN CT. PC 10895

B.M. BG 1298 ELEV. 462.555
L&T Ctr. of 2nd step N.E. Cor. of Church Bldg @ S.W. Cor. Walnut Dr. & 42' W. & 40' S. ℄ Int. Otterbein Ave.
OTTERBEIN QUAD. 1970



P.C. 8944
INDEX MAP
P.M. 3841

GENERAL NOTES:

1. ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.
2. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
3. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
4. GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
5. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND "Y" OR "T" BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
6. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
7. BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L. A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 1 AND PAY A FEE TO THE COUNTY ENGINEER, 201 E. BONITA AVE. SAN DIMAS REGIONAL OFFICE, TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
8. IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.
9. APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
10. REFER TO SECTION 7-10.4.1 OF THE STANDARD SPECIFICATIONS, REGARDING SAFETY ORDERS.

CONSTRUCTION NOTES:

1. WORK SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (1970 EDITION WITH 1971 & 72 SUPPLEMENTS) AND COUNTY ENGINEER SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWERS DATED APRIL 10, 1972 AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.
2. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE, MADISON 9-4747, EXT. 81551, AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
3. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE EXCEPT AS NOTED.
4. WYE OR TEE BRANCHES MAY BE USED FOR CONNECTIONS TO MAINLINE SEWERS EXCEPT AS NOTED.
5. ALL STRUCTURES SHALL BE EITHER BRICK MANHOLES PER S-3 OR PRECAST CONCRETE MANHOLES PER S-36, EXCEPT AS NOTED.
6. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
7. MANHOLE TOPS IN UNIMPROVED RIGHTS OF WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
8. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "D", "F", OR "G" PER STANDARD SPECIFICATIONS SECTION 208-2.
9. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-23, CASE II, TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE.
10. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-23, CASE II UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
11. ALL JOINTS BETWEEN CAST IRON PIPE AND VITRIFIED CLAY PIPE SHALL BE MADE WITH A RUBBER SLEEVE JOINT, TYPE "C" OR "D" (WITH BUSHING IF NECESSARY) PER STANDARD SPECIFICATIONS, SECTION 208-2.
12. SEWERS TO BE TESTED FOR LEAKAGE PER SECTION 306-2.3.7 OF THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
13. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.

PROFILE, ALIGNMENT AND GRADE OF

SANITARY SEWERS

PAGE 1

TO BE CONSTRUCTED IN

WALNUT DR.
P.M. 3841

PRIVATE CONTRACT NO. 8944

W.S. 38, D-4

1 SHEETS; 2 PAGES

SCALE: VERT. 1" — 4' HORIZ. 1" — 40' SEPTEMBER, 1973

44218

PREPARED IN THE OFFICES OF
M.W. FINLEY CO.
1039 S. SAN GABRIEL BLVD.
SAN GABRIEL, CA. PHONE 213-286-3175

BY: Donald V. Kendall
REG. C. E. No. 8740

THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF THE COUNTY ENGINEER SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT:

LEGEND	S-1
MINIMUM PUBLIC SAFETY REQUIREMENTS	S-2
BRICK MANHOLE	S-3
STANDARD MANHOLE STEP	S-17
BEDDING FOR SEWER PIPE	S-21
CRADLING AND ENCASEMENT	S-23
WYE OR TEE SUPPORT	S-25
ALLOWABLE TRENCH WIDTHS	S-33
LOCKING MANHOLE FRAME AND COVER	S-35
NON-REINFORCED PRECAST CONCRETE MANHOLE	S-36

COUNTY OF LOS ANGELES, CALIFORNIA

JOHN A. LAMBIE, COUNTY ENGINEER — JOHN D. PARKHURST, CHIEF ENGINEER, CO. SAN. DIST. NO. 21

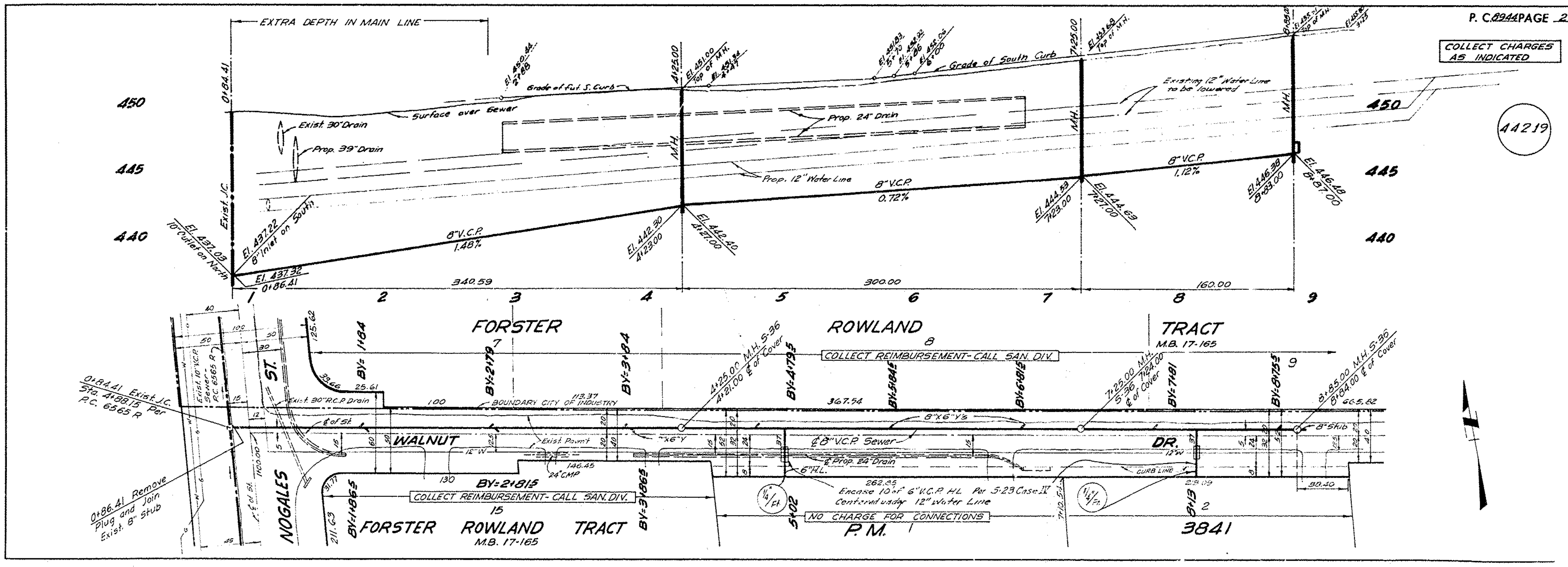
APPROVED B.F. Norling, SAN DIMAS REGIONAL ENGINEER — APPROVED D. [illegible], OFFICE ENGINEER

CHECKED Thomas E. [illegible] 7 Sept 73 (DATE)

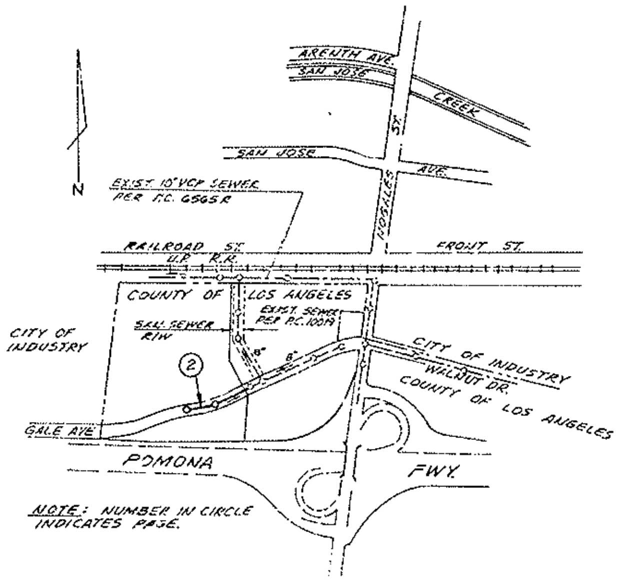
REG. C.E. NO. 19156

LA PUENTE BLDG. DIST. 20 — J. N. 0250.05

P. C. 8944 PAGE 2



B.M. CG 2625 ELEV. 433.693
CITY OF INDUSTRY BR MON IN NW COR CONC. FRAME AROUND GAS VALVES 30 FT. S/O & RAILROAD ST. OPP. BLDG NO. 18451 + 0.25 MI E/O E INT. FULLERTON RD.
OTTERBEIN QUAD. 19 80



NOTE: NUMBER IN CIRCLE INDICATES PAGE.

INDEX MAP
P.C. 10469, P.M. NO. 16732
SCALE: 1" = 600'

NO CONNECTION FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS UNTIL A PERMIT FOR INDUSTRIAL WASTEWATER DISCHARGE HAS BEEN ISSUED BY THE SANITATION DISTRICTS FOR SAID CONNECTION.

BEFORE BREAKING INTO OR CONSTRUCTION ON A COUNTY SANITATION DISTRICT SEWER AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT, SANITATION DISTRICT INSPECTOR SHALL BE NOTIFIED BY PHONE (818) 962-8605 SO THAT REQUIRED INSPECTION CAN BE MADE.

CITY OF INDUSTRY
APPROVED John Radecki
RCE NO. 20330
JOHN RADECKI, CITY ENGINEER

GENERAL NOTES:

1. ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.
2. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE DIRECTOR OF PUBLIC WORKS.
3. NO REPRESENTATIVE OF THE DEPT. OF PUBLIC WORKS WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
4. GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
5. THE PRIVATE ENGINEER SHALL FURNISH THE DEPARTMENT OF PUBLIC WORKS WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND "Y" OR "T" BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
6. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
7. BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE ROAD ELEMENT OF THE LOS ANGELES DEPT. OF PUBLIC WORKS, DISTRICT OFFICE NO. ____ AND PAY A FEE TO THE DIRECTOR OF PUBLIC WORKS, 2250 ALCAZAR ST. LOS ANGELES, CA 90033 TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
8. IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.
9. APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
10. REFER TO SECTION 7.10.4.1 OF THE STANDARD SPECIFICATIONS, REGARDING SAFETY ORDERS.
11. PRIOR TO THE ISSUANCE OF THE REQUIRED SEWER CONSTRUCTION PERMIT, THE CONTRACTOR SHALL OBTAIN AND FILE WITH THE DEPARTMENT OF PUBLIC WORKS, COPIES OF A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE ROAD ELEMENT OF THE LOS ANGELES DEPARTMENT OF PUBLIC WORKS, A PERMIT FOR EXCAVATIONS AND TRENCHES FROM THE STATE OF CALIFORNIA, DIVISION OF INDUSTRIAL SAFETY AND A CERTIFICATE OF WORKERS COMPENSATION INSURANCE WITH THE DEPARTMENT OF PUBLIC WORKS, 2250 ALCAZAR ST., LOS ANGELES, CALIFORNIA 90033 NAMED AS THE CERTIFICATE HOLDER TO BE NOTIFIED 30 DAYS PRIOR TO CANCELLATION OF POLICY.

CONSTRUCTION NOTES:

1. WORK SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (1985 EDITION WITH .... SUPPLEMENTS) AND COUNTY ENGINEER SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWERS DATED .... SEPT. 21, 1976 .... AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.
2. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE, 226-8281, AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
3. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE EXCEPT AS NOTED.
4. WYE OR TEE BRANCHES MAY BE USED FOR CONNECTIONS TO MAINLINE SEWERS EXCEPT AS NOTED.
5. ALL STRUCTURES SHALL BE EITHER BRICK MANHOLES PER S-3 OR PRECAST CONCRETE MANHOLES PER S-36, EXCEPT AS NOTED.
6. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
7. MANHOLE TOPS IN UNIMPROVED RIGHTS OF WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
8. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "D" OR "G" PER STANDARD SPECIFICATIONS SECTION 208-2.
9. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-23, CASE II, TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE.
10. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-23, CASE II UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF PUBLIC WORKS.
11. ALL JOINTS BETWEEN CAST IRON PIPE AND VITRIFIED CLAY PIPE SHALL BE MADE WITH A RUBBER SLEEVE JOINT. TYPE "C" OR "D", (WITH BUSHING IF NECESSARY) PER STANDARD SPECIFICATIONS SECTION 208-2.
12. SEWERS TO BE TESTED FOR LEAKAGE PER SECTION 306-1.4 OF THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
13. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY PUBLIC WORKS OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
14. FULL COMPLIANCE WITH SECTION 306-1.3.4 OF THE STD. SPECIFICATIONS WILL BE REQUIRED FOR BACKFILL IN STREETS. CERTIFICATION OF BACKFILL COMPACTION AND SAND EQUIVALENTS BY A QUALIFIED, REGISTERED TESTING LABORATORY SHALL BE PROVIDED BY THE PERMITTEE PRIOR TO THE ISSUANCE OF A CERTIFICATE OF PARTIAL ACCEPTANCE.
15. SPECIAL BACKFILL IN EASEMENT CONSTRUCTION: (A) BACKFILL TRENCH AND REPLACE OTHER EARTH SO AS TO ACHIEVE THE NATURAL OR FINISHED GRADES AND SLOPES SHOWN ON THE GRADING PLAN APPROVED FOR THIS DEVELOPMENT BY THE BUILDING AND SAFETY DIVISION. (B) ALL BACKFILL AND EARTH REPLACED SHALL BE COMPACTED TO A MINIMUM OF 90% OF MAXIMUM DENSITY PER A.S.T.M. STD. METHOD OF TEST D1557 AS MODIFIED. ACCEPTABLE CERTIFICATION OF SUCH COMPACTION SHALL BE SUBMITTED TO THE CONSTRUCTION DIVISION.

PROFILE, ALIGNMENT AND GRADE OF

PAGE 1

SANITARY SEWERS

TO BE CONSTRUCTED IN

PM NO. 16732

PRIVATE CONTRACT NO. 10469

U-130
W.S. 38
1 SHEET ; 2 PAGES
SCALE: VERT. 1" = 4' HORIZ. 1" = 40' JULY 24, 1986
PREPARED IN THE OFFICES OF
WILLIAMSON & SCHMID
1630 E. FRANCIS STREET, SUITE B
ONTARIO, CA. 91761
BY: Maurice Murad
REG. C. E. No. 33366
EXP. 6-30-90

REGISTERED PROFESSIONAL ENGINEER MAURICE MURAD 33366 EXP. 6-30-90 CIVIL STATE OF CALIFORNIA

THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF THE COUNTY ENGINEER SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT:

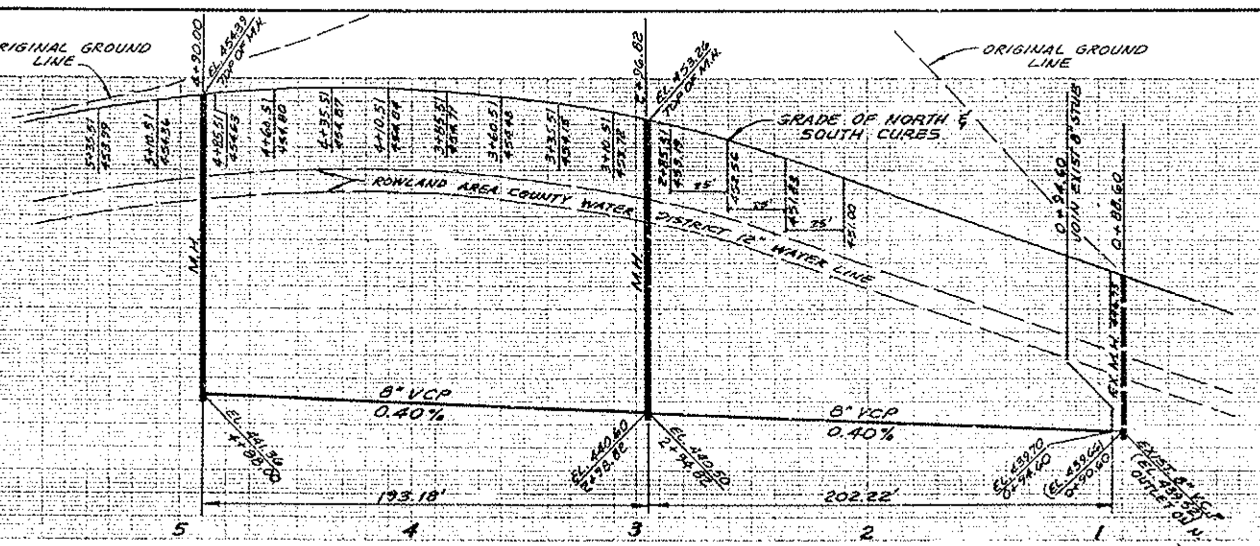
LEGEND	S-1
MINIMUM PUBLIC SAFETY REQUIREMENTS	S-2
BRICK MANHOLE	S-3
STANDARD MANHOLE STEP	S-17
BEDDING FOR SEWER PIPE	S-21
CRADLING AND ENCASEMENT	S-23
WYE OR TEE SUPPORT	S-26
ALLOWABLE TRENCH WIDTHS	S-33
LOCKING MANHOLE FRAME AND COVER	S-35
NON-REINFORCED PRECAST CONCRETE MANHOLE	S-36

52003

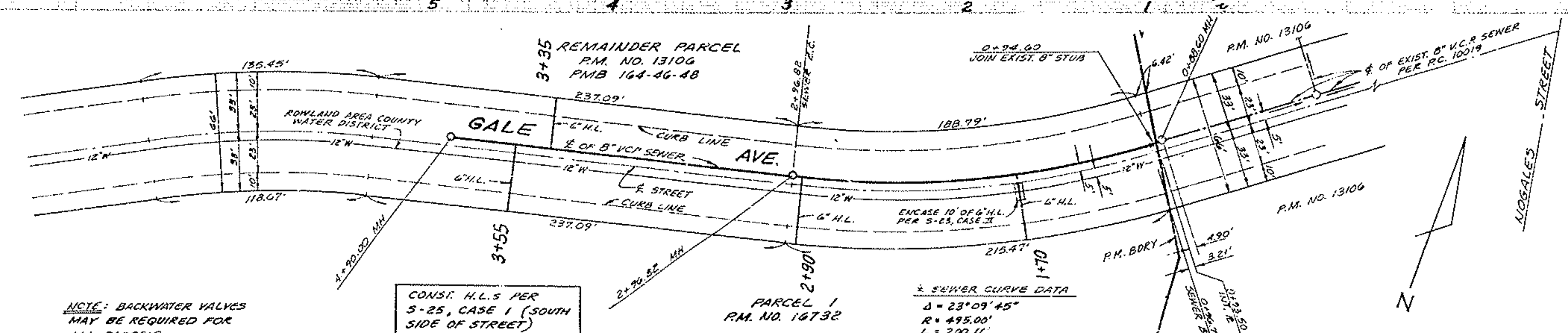
COUNTY OF LOS ANGELES, CALIFORNIA
THOMAS A. TIDEMANSON, DIRECTOR OF PUBLIC WORKS
CHARLES W. CARRY, CHIEF ENGINEER
CO. SAN DIST. NO. 21
APPROVED Brian D. Hogan 10/29/86 (DATE)
APPROVED [illegible] 11/10/86 for OFFICE ENGINEER
CHECKED [illegible] 10-29-86 (DATE)
REG. C.E. NO. 11536
LA PUENTE BLDG. DIST. 2

P.C. 10469 PAGE 2
REVIEWED BY: Sandy G. [illegible] 10-29-86 DATE

NO LOS ANGELES COUNTY CHARGES FOR CONNECTION.
SEE LOS ANGELES COUNTY SANITATION DIST. FOR SPECIAL CONNECTION CHARGES.



52004

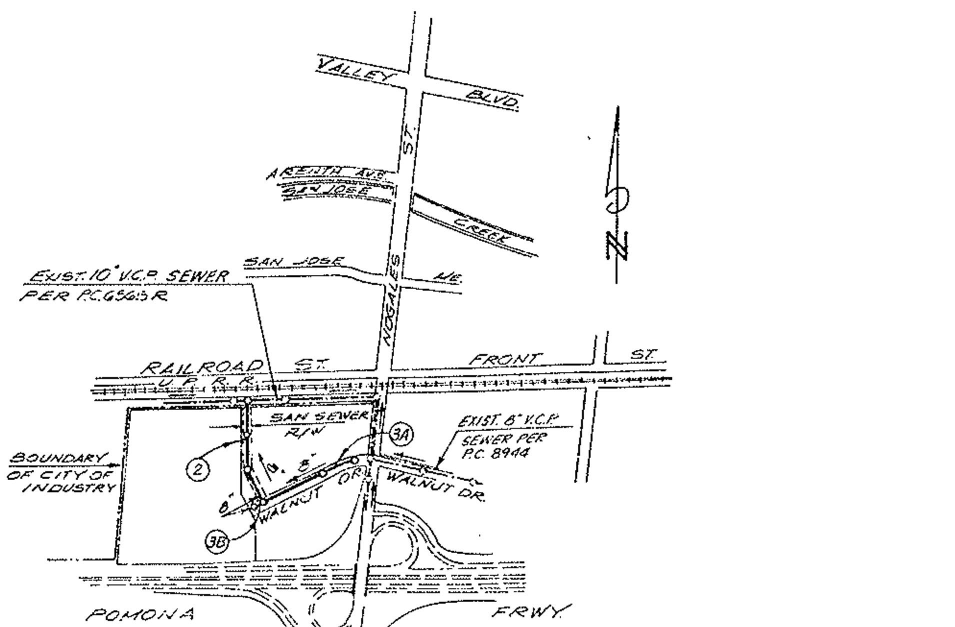


CONST. H.L.s PER S-25, CASE 1 (SOUTH SIDE OF STREET)

NOTE: BACKWATER VALVES MAY BE REQUIRED FOR ALL PARCELS.

℄ SEWER CURVE DATA
Δ = 23°09'45"
R = 495.00'
L = 200.11'
T = 101.44'

B.M. CG 2625 ELEV. 433.693
CITY OF INDUSTRY BR MON IN NW COR CONC FRAME AROUND GAS VALVES 30 FT S/O ℄ RAILROAD ST. OPP BLDG NO. 18451 + 0.25 MI E/O ℄ INT. FULLERTON RD
OTTERBEIN QUAD. 1980



INDEX MAP
P.C. 10019 - PARCEL MAP NO. 13106
SCALE 1" = 600' NOTE: NUMBERS IN CIRCLES INDICATE PAGE NUMBERS.

NO CONNECTION FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS UNTIL A PERMIT FOR INDUSTRIAL WASTEWATER DISCHARGE HAS BEEN ISSUED BY THE SANITATION DISTRICTS FOR SAID CONNECTION.

BEFORE BREAKING INTO OR CONSTRUCTION ON A COUNTY SANITATION DISTRICT SEWER AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT, SANITATION DISTRICT INSPECTOR SHALL BE NOTIFIED BY PHONE - 962-8605. ~~699-2101~~ SO THAT REQUIRED INSPECTION CAN BE MADE.

REVISION No. 1 DATE 10-5-83
REVISED LOCATION OF 6" H.L. (FROM STATION 3+85± TO STA. 5+66±) ON PAGE 2. ADDED & REVISED LOCATION OF 8"X6" WYES TO STA. 1+69±, 2+94±, AND 3+94± ON PAGE 2.
APPROVED [signature]
OFFICE OF COUNTY ENGINEER

GENERAL NOTES:

1. ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.
2. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
3. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
4. GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
5. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND "Y" OR "T" BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
6. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
7. BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN CITY OF INDUSTRY STREETS FROM THE OFFICE OF THE CITY ENGR, 2??? N. ??? ???, INDUSTRY, CA AND PAY A FEE TO THE COUNTY ENGINEER, 550 S. VERMONT AVENUE, LOS ANGELES, CA 90020, TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
8. IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.
9. APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
10. REFER TO SECTION 7.10.4.1 OF THE STANDARD SPECIFICATIONS, REGARDING SAFETY ORDERS.
11. PRIOR TO THE ISSUANCE OF THE REQUIRED SEWER CONSTRUCTION PERMIT, THE CONTRACTOR SHALL OBTAIN AND FILE WITH THE COUNTY ENGINEER COPIES OF A PERMIT TO EXCAVATE IN CITY OF INDUSTRY STREETS FROM THE OFFICE OF THE CITY ENGINEER, A PERMIT FOR EXCAVATIONS AND TRENCHES FROM THE STATE OF CALIFORNIA, DIVISION OF INDUSTRIAL SAFETY AND A CERTIFICATE OF WORKER'S COMPENSATION INSURANCE WITH THE DEPARTMENT OF COUNTY ENGINEER, 550 SOUTH VERMONT, RM. 408, LOS ANGELES, CALIFORNIA 90020, NAMED AS THE CERTIFICATE HOLDER TO BE NOTIFIED 30 DAYS PRIOR TO CANCELLATION OF POLICY.

CONSTRUCTION NOTES:

1. WORK SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (1982 EDITION W/SUPP... SUPPLEMENTS) AND COUNTY ENGINEER SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWERS DATED SEPT. 21, 1976 AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.
2. THE CONTRACTOR SHALL NOTIFY THE ENVIRONMENTAL DEVELOPMENT DIVISION BY TELEPHONE, 738-2156, AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
3. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE EXCEPT AS NOTED.
4. WYE OR TEE BRANCHES MAY BE USED FOR CONNECTIONS TO MAINLINE SEWERS EXCEPT AS NOTED.
5. ALL STRUCTURES SHALL BE EITHER BRICK MANHOLES PER S-3 OR PRECAST CONCRETE MANHOLES PER S-36, EXCEPT AS NOTED.
6. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
7. MANHOLE TOPS IN UNIMPROVED RIGHTS OF WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
8. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "D" OR "G" PER STANDARD SPECIFICATIONS SECTION 208-2.
9. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-33, CASE II, TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE.
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11. ALL JOINTS BETWEEN CAST IRON PIPE AND VITRIFIED CLAY PIPE SHALL BE MADE WITH A RUBBER SLEEVE JOINT, TYPE "C" OR "D", (WITH BUSHING IF NECESSARY) PER STANDARD SPECIFICATIONS, SECTION 208-2.
12. SEWERS TO BE TESTED FOR LEAKAGE PER SECTION 306-1.4 OF THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
13. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
14. FULL COMPLIANCE WITH SECTION 306-1.3.5 OF THE SPECIAL PROVISIONS WILL BE REQUIRED FOR BACKFILL IN STREETS. CERTIFICATION OF BACKFILL COMPACTION AND SAND EQUIVALENTS BY A QUALIFIED, REGISTERED TESTING LABORATORY SHALL BE PROVIDED BY THE PERMITTEE PRIOR TO THE ISSUANCE OF A CERTIFICATE OF PARTIAL ACCEPTANCE.
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PROFILE, ALIGNMENT AND GRADE OF PAGE 1

SANITARY SEWERS

TO BE CONSTRUCTED IN

PARCEL MAP NO. 13106

PRIVATE CONTRACT NO. 10019

50303

W.S. 38-D, 4
2 SHEETS; 3 PAGES
SCALE: VERT. 1" = 4' HORIZ. 1" = 40' OCTOBER, 1981
PREPARED IN THE OFFICES OF
WILLIAMSON & SCHMID
17792 SKY PARK BLVD, IRVINE, CALIFORNIA 92714
BY: [signature]
REG. C.E. No. 24876

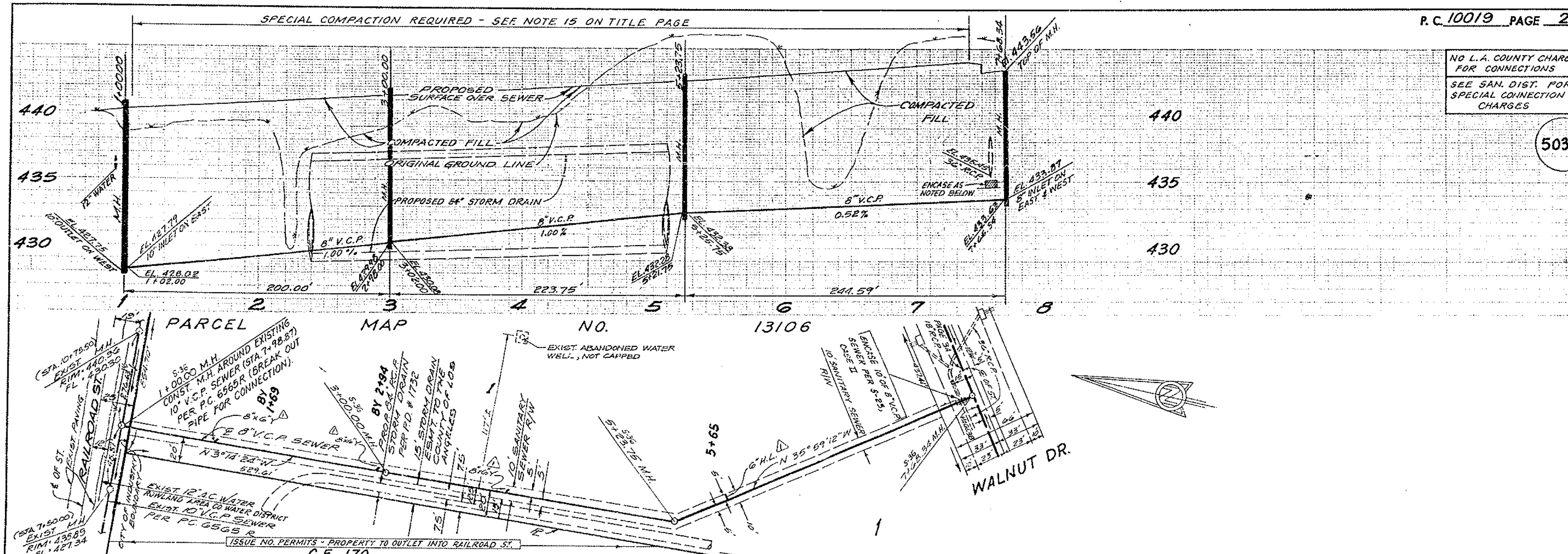
THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF THE COUNTY ENGINEER SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT:

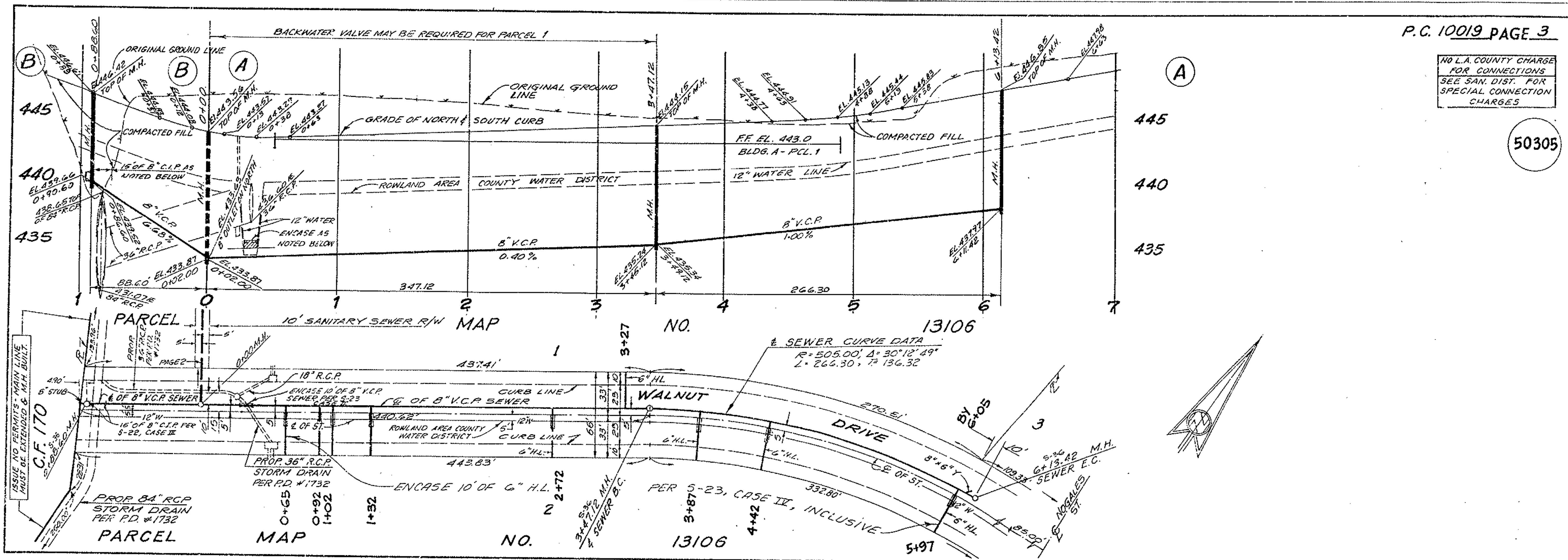
LEGEND	S-1
MINIMUM PUBLIC SAFETY REQUIREMENTS	S-2
BRICK MANHOLE	S-3
STANDARD MANHOLE STEP	S-17
BEDDING FOR SEWER PIPE	S-21
CRADLING AND ENCASEMENT	S-33
WYE OR TEE SUPPORT	S-26
ALLOWABLE TRENCH WIDTHS	S-33
LOCKING MANHOLE FRAME AND COVER	S-35
NON-REINFORCED PRECAST CONCRETE MANHOLE	S-36
SPECIAL SUPPORT AND PROTECTION	S-26

COUNTY OF LOS ANGELES, CALIFORNIA
STEPHEN J. KOONCE, COUNTY ENGINEER WALTER E. GARRISON, CHIEF ENGINEER
CO. SAN DIST. NO. 21
APPROVED [signature] 6/28/83
SAN DIMAS REGIONAL ENGINEER (DATE)
APPROVED [signature] 7/1/83
FOR OFFICE ENGINEER
CHECKED [signature] 6-30-83 (DATE)
REG. C.E. NO. 33134
LA PUENTE BLDG. DIST. 2.00

CITY OF INDUSTRY
APPROVED [signature]
JOHN RADECKI
R.C.E. NO. 20330
CITY ENGINEER

P.C. 10019 PAGE 2





P.C. 10019 PAGE 3
NO L.A. COUNTY CHARGE FOR CONNECTIONS
SEE SAN. DIST. FOR SPECIAL CONNECTION CHARGES
50305
BACKWATER VALVE MAY BE REQUIRED FOR PARCEL 1
ORIGINAL GROUND LINE
GRADE OF NORTH & SOUTH CURB
COMPACTED FILL
F.F. EL. 443.0
BLDG. A - PCL. 1
12" WATER LINE
ROWLAND AREA COUNTY WATER DISTRICT
8" V.C.P. 6.68%
8" V.C.P. 0.40%
8" V.C.P. 1.00%
12" WATER
ENCASE AS NOTED BELOW
15' OF 8" C.I.P. AS NOTED BELOW
36" R.C.P.
347.12
266.30
445
440
435
PARCEL MAP NO. 13106
10' SANITARY SEWER R/W
C.F. 170
ISSUE NO PERMITS - MAIN LINE MUST BE EXTENDED & M.H. BUILT.
& SEWER CURVE DATA
R= 505.00', Δ= 30°12'49"
L= 266.30, T= 136.32
WALNUT DRIVE
437.41'
443.83'
270.E1'
332.80'
18" R.C.P.
ENCASE 10' OF 8" V.C.P. SEWER PER S-23
& OF 8" V.C.P. SEWER
CURB LINE
ROWLAND AREA COUNTY WATER DISTRICT
PROP. 36" R.C.P. STORM DRAIN PER P.D. #1732
ENCASE 10' OF 6" H.L.
PROP. 84" RCP STORM DRAIN PER P.D. #1732
PER S-23, CASE IV, INCLUSIVE
& NOGALES ST.
SEWER E.C.

PAGE

B.M. C OF I 5-7 ELEV. 433.58
BRASS CAP AT S.E. CORNER JELLICK AVENUE AND RAILROAD STREET ON NORTHWEST CORNER OF 6'x22' CONC. GAS CO. METER PIT.
QUAD. 19

LEGEND

- INDICATES SANITARY SEWERS AND MANHOLES TO BE CONSTRUCTED.
- INDICATES EXISTING SANITARY SEWERS AND MANHOLES.
- INDICATES PROPOSED SANITARY SEWERS AND MANHOLES, OR SHOWN ON ANOTHER VIEW.
- INDICATES SHALLOW MANHOLE.

GENERAL NOTES:

1. ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.
2. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE CITY ENGINEER.
3. NO REPRESENTATIVE OF THE CITY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
4. GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
5. THE PRIVATE ENGINEER SHALL FURNISH THE CITY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND "Y" OR "T" BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
6. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
7. BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN CITY STREETS FROM THE OFFICE OF THE CITY ENGINEER AND PAY A FEE TO THE CITY OF INDUSTRY, 15651 E. STAFFORD STREET, INDUSTRY, CALIFORNIA TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
8. IF WORK IS TO DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.
9. APPROVAL OF THIS PLAN BY THE CITY OF INDUSTRY DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
10. REFER TO SECTION 7.10.4.1 OF THE STANDARD SPECIFICATIONS, REGARDING SAFETY ORDERS.

PROFILE, ALIGNMENT AND GRADE OF

SANITARY SEWERS

TO BE CONSTRUCTED IN

PARCEL MAP NO. 261

INDUSTRY PRIVATE CONTRACT NO. 251

I.W.S. NO. 5

2 SHEETS; 4 PAGES

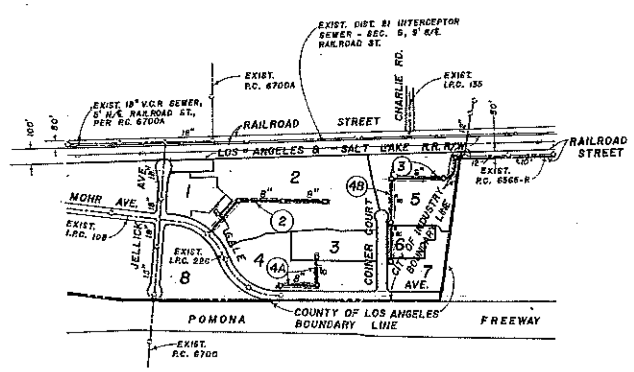
SCALE: VERT. 1" – 4' HORIZ. 1" – 40'

OCTOBER, 1988

PREPARED IN THE OFFICES OF
THOMSEN ENGINEERING, INC.
16163 E. WHITTIER BLVD.
WHITTIER, CA 90609, TEL.(213)691-0836

BY: Hans C. Thomsen
REG. C.E. No. 8244

REGISTERED PROFESSIONAL ENGINEER HANS C. THOMSEN No. 8244 Exp. 9-30-92 CIVIL STATE OF CALIFORNIA



INDEX MAP
SCALE: 1" = 600'
I.P.C. NO. 251
CITY OF INDUSTRY
P.M. NO. 261

CONSTRUCTION NOTES CONTIN....

16. SEWER TRENCH BACKFILL WITHIN EASEMENT:
(A) BACKFILL TRENCH AND REPLACE OTHER EARTH REMOVED, SO AS TO ACHIEVE THE NATURAL OR FINISHED GRADES AND SLOPES SHOWN ON THE GRADING PLAN APPROVED FOR THIS PARCEL MAP BY THE CITY OF INDUSTRY. (B) ALL BACKFILL EARTH REPLACED SHALL BE COMPACTED TO A MINIMUM OF 90 PERCENT OF MAXIMUM DENSITY PER ASTM D696-577, AS MODIFIED. ACCEPTABLE CERTIFICATION OF SUCH COMPACTION SHALL BE SUBMITTED TO THE CITY ENGINEER, CITY OF INDUSTRY.

NO CONNECTION FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS UNTIL A PERMIT FOR INDUSTRIAL WASTEWATER DISCHARGE HAS BEEN ISSUED BY THE SANITATION DISTRICTS FOR SAID CONNECTION.

BEFORE BREAKING INTO OR CONSTRUCTION ON A COUNTY SANITATION DISTRICT SEWER AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT, SANITATION DISTRICT INSPECTOR SHALL BE NOTIFIED BY PHONE (818) 962-8605 SO THAT REQUIRED INSPECTION CAN BE MADE.

CONSTRUCTION NOTES:

1. WORK SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (1988 EDITION WITH LATEST SUPPLEMENT(S) AND COUNTY ENGINEER SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWERS DATED SEPTEMBER 21, 1976 AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE CITY ENGINEER.
2. THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER OF INDUSTRY BY TELEPHONE (818)333-0336 AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
3. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE EXCEPT AS NOTED.
4. WYE OR TEE BRANCHES MAY BE USED FOR CONNECTIONS TO MAINLINE SEWERS EXCEPTED AS NOTED.
5. ALL STRUCTURES SHALL BE EITHER BRICK SEWER MANHOLES PER S-3 OR PRECAST CONCRETE SEWER MANHOLES PER S-36, EXCEPT AS NOTED.
6. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
7. MANHOLE TOPS IN UNIMPROVED RIGHTS OF WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
8. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "D", "F", OR "G" PER STANDARD SPECIFICATIONS SECTION 208-2.
9. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-23, CASE II, TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE.
10. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS. THE PIPE SHALL BE ENCASED PER S-23, CASE II UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
11. ALL JOINTS BETWEEN CAST IRON PIPE AND VITRIFIED CLAY PIPE SHALL BE MADE WITH A RUBBER SLEEVE JOINT, TYPE "C" OR "D", (WITH BUSHING IF NECESSARY) PER STANDARD SPECIFICATIONS, SECTION 208-2.
12. SEWERS TO BE TESTED FOR LEAKAGE PER SECTION 306-1.4 OF THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
13. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET CITY OF INDUSTRY OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
14. FULL COMPLIANCE WITH SECTION 306-1.2.4 OF THE STANDARD SPECIFICATIONS WILL BE REQUIRED FOR BACKFILL IN STREETS. CERTIFICATION OF BACKFILL COMPACTION AND SAND EQUIVALENTS BY A QUALIFIED, REGISTERED TESTING LABORATORY SHALL BE PROVIDED BY THE PERMITTEE PRIOR TO THE ISSUANCE OF A CERTIFICATE OF PARTIAL ACCEPTANCE.
15. ALL WYES AND/OR HOUSE LATERALS ARE TO BE LOCATED AT LEAST FIVE FEET APART AND WHEN POSSIBLE NOT CLOSER THAN FIVE FEET TO ANY MANHOLE.

REVISED SEWER LINE 4B GRADES 3-28-89
DATE 3-28-89 BY Hans C. Thomsen

THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF THE COUNTY ENGINEER SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT:

LEGEND	S-1
MINIMUM PUBLIC SAFETY REQUIREMENTS	S-2
BRICK MANHOLE	S-3
STANDARD MANHOLE STEP	S-17
BEDDING FOR SEWER PIPE	S-21
CRADLING AND ENCASEMENT	S-23
WYE OR TEE SUPPORT	S-26
ALLOWABLE TRENCH WIDTHS	S-33
LOCKING MANHOLE FRAME AND COVER	S-35
NON-REINFORCED PRECAST CONCRETE MANHOLE	S-36
BREAKING INTO EXISTING BRICK OR PRE-CAST MANHOLE	S-13
RECTANGULAR MANHOLE FRAME & COVERS	S-16
PRECAST CONCRETE SHALLOW MANHOLE	S-32
DESIGN REQUIREMENTS FOR SANITARY SEWERS IN THE VICINITY OF PRESSURE WATER MAINS	S-01

CITY OF INDUSTRY, CALIFORNIA

JOHN J. RADECKI JR. CITY ENGINEER — CHARLES W. CARRY CHIEF ENGINEER

CO. SAN DIST. NO. 21

APPROVED [signature] 1/31/89 (DATE) — APPROVED [signature] for OFFICE ENGINEER 2/5/89

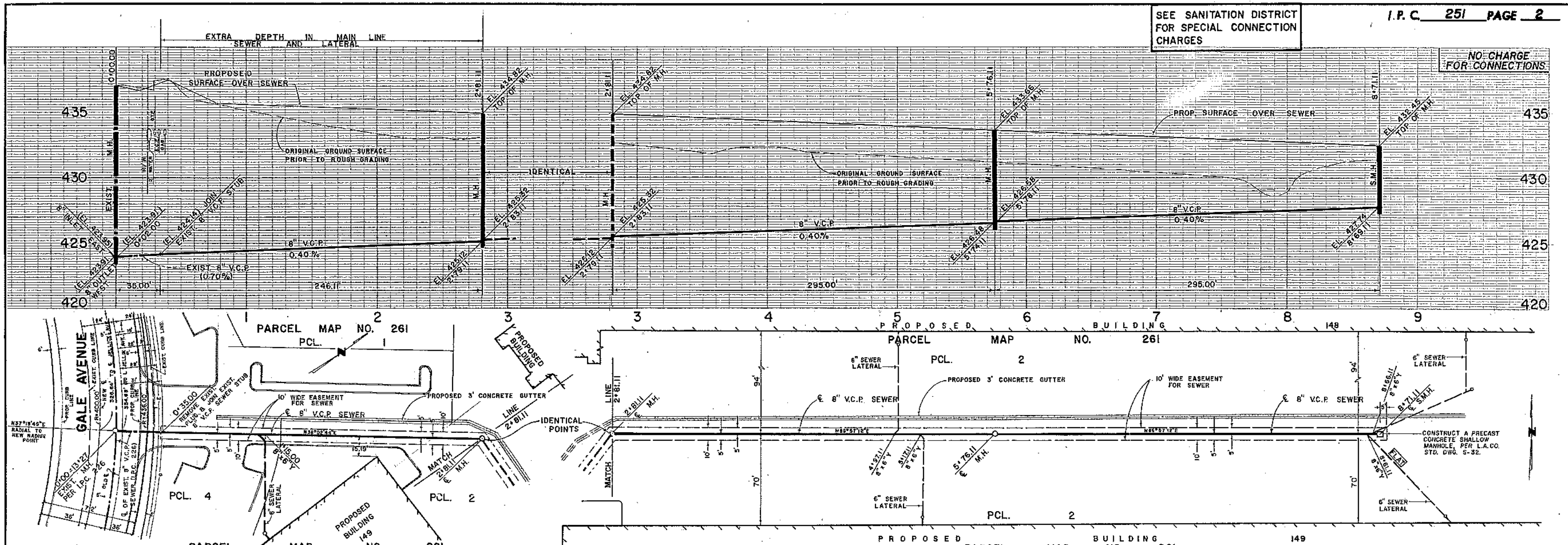
BY John D Bellas DATE 4/3/89
DEPARTMENT OF PUBLIC WORKS
CONSOLIDATED SEWER MAINTENANCE DISTRICT
REVIEW FOR MAINTENANCE

REVIEWED BY: H R Khajavi 2-3-89 (DATE)

J.N. 7302/7317

SEE SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES

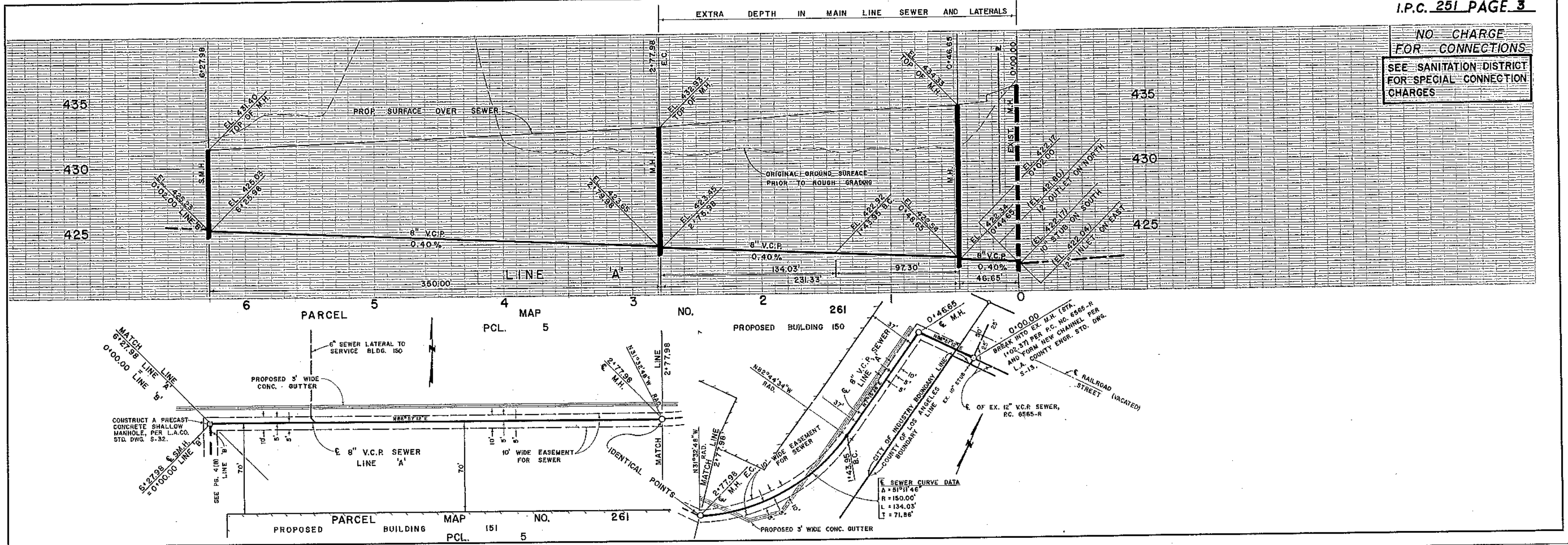
NO CHARGE FOR CONNECTIONS

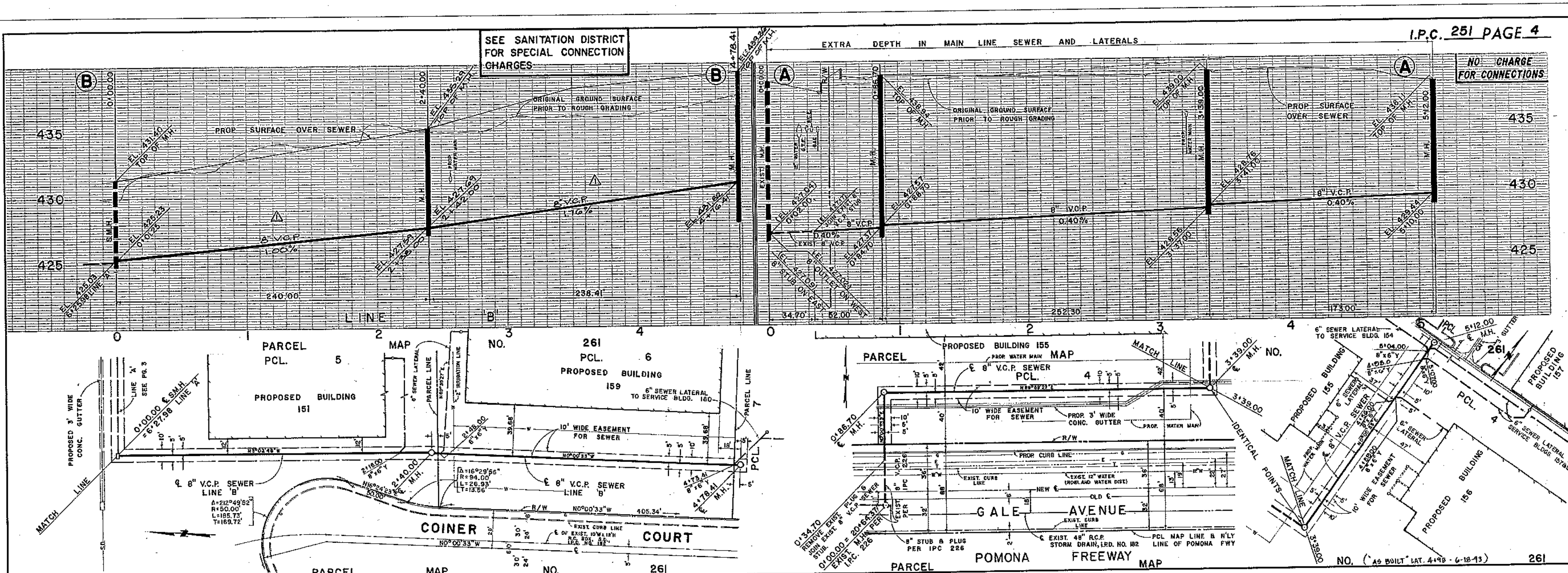


L.A. COUNTY SEWER SHEET NO. 1 C.M. Jr.(213) 699-8440 12/87

IPC 251

PC 251


I.P.C. 251 PAGE 3
EXTRA DEPTH IN MAIN LINE SEWER AND LATERALS
NO CHARGE FOR CONNECTIONS
SEE SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES
PROP. SURFACE OVER SEWER
ORIGINAL GROUND SURFACE PRIOR TO ROUGH GRADING
8" V.C.P. 0.40%
LINE 'A'
PARCEL MAP NO. 261
PCL. 5
PROPOSED BUILDING 150
PROPOSED BUILDING 151
6" SEWER LATERAL TO SERVICE BLDG. 150
PROPOSED 3' WIDE CONC. GUTTER
CONSTRUCT A PRECAST CONCRETE SHALLOW MANHOLE, PER L.A.CO. STD. DWG. S-32.
℄ 8" V.C.P. SEWER LINE 'A'
10' WIDE EASEMENT FOR SEWER
IDENTICAL POINTS
℄ RAILROAD STREET (VACATED)
℄ OF EX. 12" V.C.P. SEWER, P.C. 6565-R
℄ SEWER CURVE DATA
Δ = 51°11'46"
R = 150.00'
L = 134.03'
T = 71.86'
PROPOSED 3' WIDE CONC. GUTTER


I.P.C. 251 PAGE 4
SEE SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES
EXTRA DEPTH IN MAIN LINE SEWER AND LATERALS
NO CHARGE FOR CONNECTIONS
ORIGINAL GROUND SURFACE PRIOR TO ROUGH GRADING
PROP. SURFACE OVER SEWER
8" V.C.P. 1.00%
8" V.C.P. 1.16%
8" V.C.P. 0.40%
LINE 'B'
PARCEL MAP NO. 261
PCL. 5
PCL. 6
PROPOSED BUILDING 151
PROPOSED BUILDING 159
PROPOSED BUILDING 155
PROPOSED BUILDING 156
PROPOSED BUILDING 157
10' WIDE EASEMENT FOR SEWER
℄ 8" V.C.P. SEWER LINE 'B'
COINER COURT
GALE AVENUE
POMONA FREEWAY
IDENTICAL POINTS
("AS BUILT" LAT. 4198 - 6-18-93)

IPC 251

5421

B.M. BG 2621 ELEV. 445.409
City of Industry brass mon in conc footing of N. gate post at entrance to house #1337 Jellick Ave. 1500' N. of Fifth Ave. (Colima Rd.) & 25' W of ℄ Mkd. (BENCH MARK 5-8).
OTTERBEIN QUAD. 1965

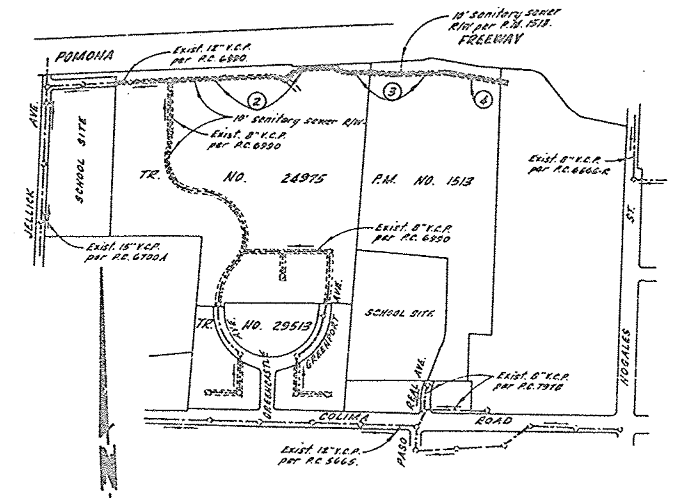
THE FOLLOWING LATEST REVISED STANDARDS ON FILE IN THE OFFICE OF THE COUNTY ENGINEER SHALL APPLY IN THE CONST. OF THIS PROJECT.

LEGEND	S-1
MINIMUM EXCAVATION SAFETY REQUIREMENTS	S-2
BRICK MANHOLE	S-3
NON-REINFORCED PRECAST CONCRETE MANHOLE	S-36
MANHOLE FRAME AND COVER	S-35
STANDARD MANHOLE STEPS	S-17
BEDDING FOR SEWER PIPE	S-21
CRADLING AND ENCASEMENT	S-23
ALLOWABLE TRENCH WIDTHS	S-33

No connections for the disposal of industrial wastes shall be made to sewers shown on these drawings without written permission from the Chief Engineer and General Manager of the [illegible] Districts.

County Sanitation Districts shall be notified [illegible] so that [illegible] made [illegible]

Acceptance of the project.



INDEX MAP
SCALE: 1"=600'
P.C. 8473
P.M. Nº 1513

Finish grading for P.M. 1513 to be in place prior to construction of sewers.

LA PUENTE BLDG. DIST. NO. 2

NOTES:

1. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE
2. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
3. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS & "Y" or "T" BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
4. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
5. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
6. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE, MADISON 9-4747, EXT. 81551, AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
7. MANHOLES SHALL BE BRICK SEWER STRUCTURES PER S-3 OR PRECAST CONCRETE MANHOLES PER S-36 EXCEPT AS NOTED.
8. "Y" OR "T" BRANCHES MAY BE USED FOR CONNECTIONS TO MAINLINE SEWERS EXCEPT AS NOTED.
9. MANHOLE TOPS IN UNIMPROVED RIGHTS-OF-WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
10. USE EXTRA STRENGTH PIPE. ALL PIPE IS STANDARD DEPTH EXCEPT AS NOTED.
11. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "D", "F" OR "G" PER STANDARD SPECIFICATIONS SECTION 207-2.
12. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-23, TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE.
13. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-23, UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
14. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE EXCEPT AS NOTED.
15. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
16. SEWERS TO BE TESTED FOR LEAKAGE PER SECTION 306-1.3.7 OF STANDARD SPECIFICATIONS.
17. REFER TO SECTIONS 7-10.4.1 OF STANDARD SPECIFICATIONS, REGARDING SAFETY ORDERS.
18. ALL JOINTS BETWEEN CAST IRON PIPE AND VITRIFIED CLAY PIPE SHALL BE MADE WITH A RUBBER SLEEVE JOINT, TYPE "C" OR "D", (WITH BUSHING IF NECESSARY) PER STD. SPECS. SECT. 208-2.

COLLECT CHARGES AS INDICATED

NOTICE TO CONTRACTOR

The existence and location of any underground utility pipes or structures shown on these plans are obtained by a search of the available records. To the best of my knowledge there are no existing utilities except as shown on these plans.
The contractor is required to take due precautionary measures to protect the utility lines shown and any other lines not of record or not shown on these plans.

George F. Jenkins R.C.E. 17994

PROFILE ALIGNMENT AND GRADE OF

SANITARY SEWERS

P.C. 8473 PAGE 1

CONSTRUCTED IN

PARCEL MAP NO. 1513
AND
RIGHTS OF WAY

PRIVATE CONTRACT NO. 8473

W.S. 38

2 SHEETS; 4 PAGES

SCALE: VERT. 1"—4' HORIZ. 1"—40' JUNE, 1970

PREPARED IN THE OFFICES OF
H. M. SCOTT & ASSOCIATES, INC.
ROSEMEAD, CALIFORNIA

By: George F. Jenkins
REG. C. E. NO. 17994

FOR LEGEND SEE PLAN NO. S-1

NOTE:

GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.
WORK SHALL BE CONSTRUCTED ACCORDING TO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (1970 EDITION) AND COUNTY ENGINEER SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWERS DATED APRIL 7, 1970 AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.
BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L.A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 1, AND PAY A FEE TO THE COUNTY ENGINEER, ROOM 330, COUNTY ENGINEERING BUILDING, 108 WEST SECOND STREET OR 201 E. BONITA AVE., SAN DIMAS REGIONAL OFFICE, SUFFICIENT TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.

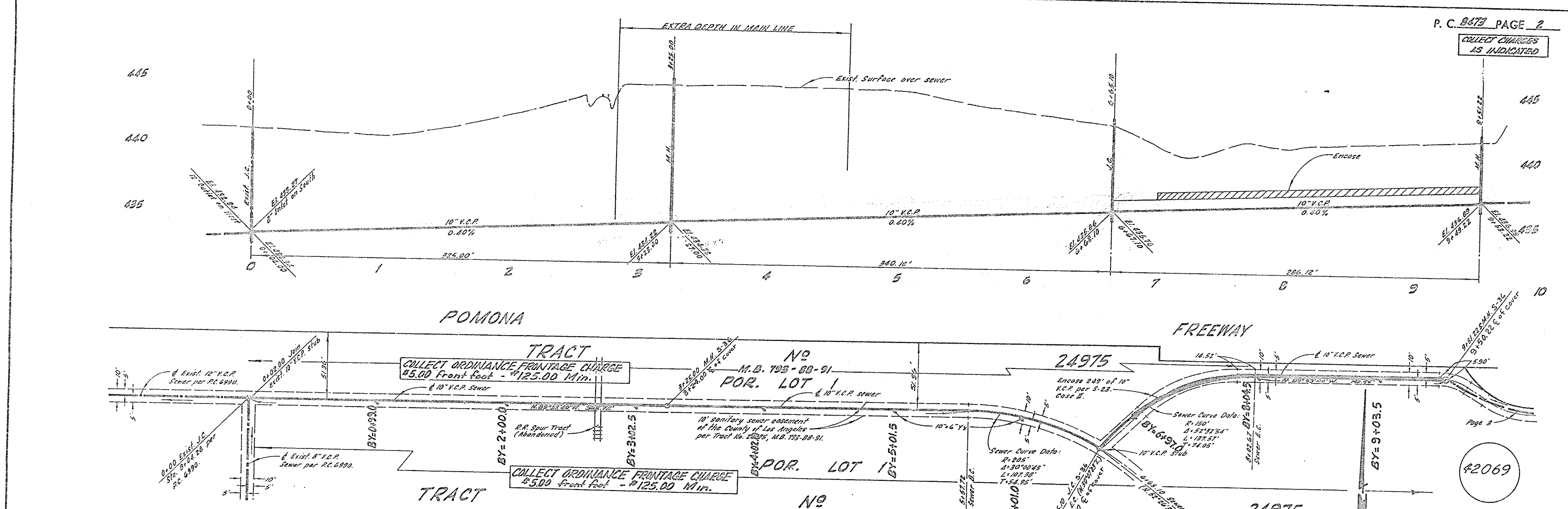
COUNTY OF LOS ANGELES, CALIFORNIA
JOHN A. LAMBIE, COUNTY ENGINEER
J. D. PARKHURST, CHIEF ENGINEER

APPROVED BY, B. F. Norling
SAN DIMAS REGIONAL ENGINEER

CO. SAN. DIST. NO. 21
APPROVED BY, [illegible]
OFFICE ENGINEER

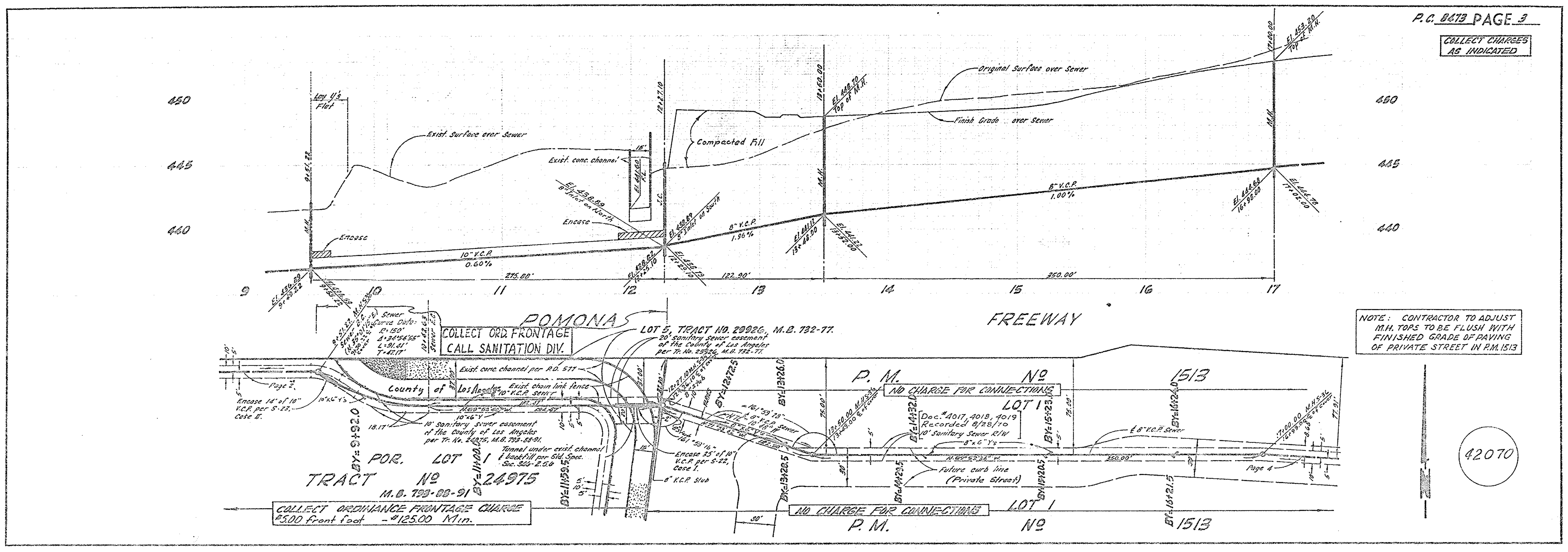
CHECKED BY, Ralph Schafer 8/4/70
REG. C.E. NO. 13906

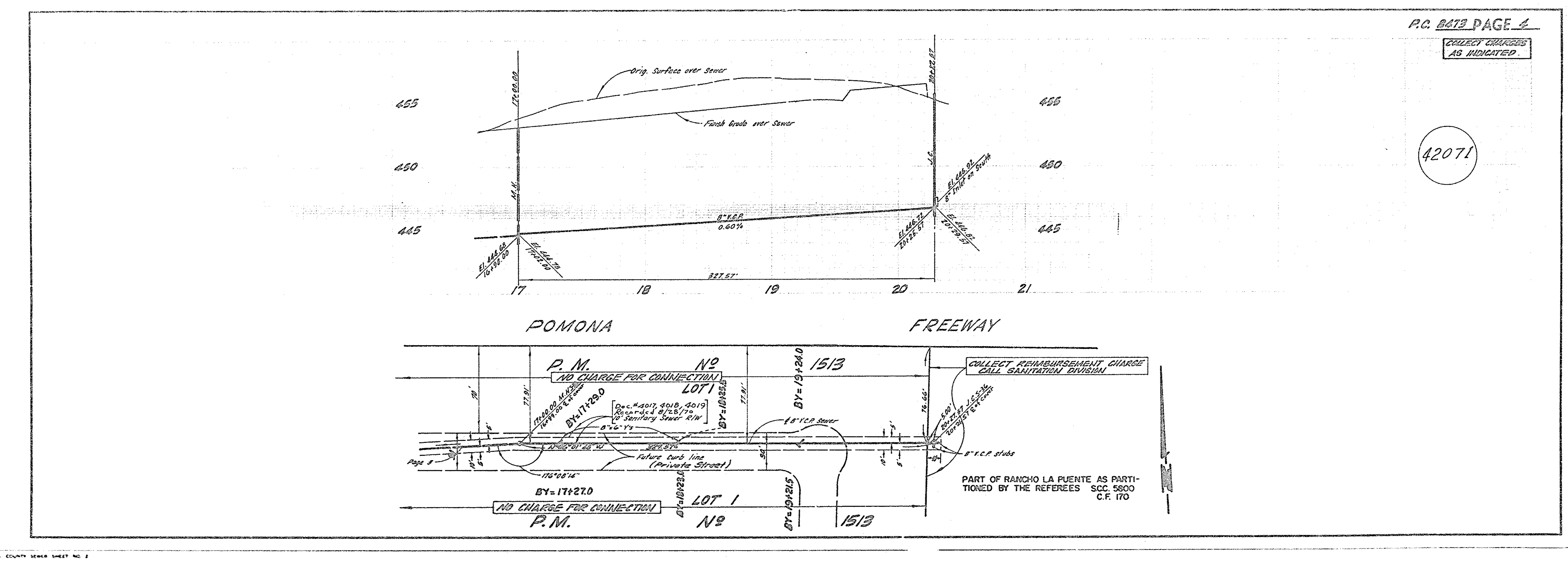
42068



3090

BART


P.C. 8673 PAGE 3
COLLECT CHARGES AS INDICATED
Original Surface over Sewer
Finish Grade over Sewer
Exist. Surface over Sewer
Compacted Fill
Exist. conc. channel
Encase
10" V.C.P. 0.60%
8" V.C.P. 1.50%
8" V.C.P. 1.00%
275.00'
122.90'
350.00'
9
10
11
12
13
14
15
16
17
460
445
440
POMONA
FREEWAY
COLLECT ORD. FRONTAGE CALL SANITATION DIV.
LOT 5, TRACT NO. 22920, M.B. 732-77.
NOTE: CONTRACTOR TO ADJUST M.H. TOPS TO BE FLUSH WITH FINISHED GRADE OF PAVING OF PRIVATE STREET IN P.M. 1513
P. M.
Nº
1513
NO CHARGE FOR CONNECTIONS
LOT 1
County of Los Angeles
Future curb line (Private Street)
POR. LOT 1
TRACT Nº 24975
M.B. 703-88-91
COLLECT ORDINANCE FRONTAGE CHARGE
$5.00 front foot - $125.00 Min.
NO CHARGE FOR CONNECTIONS
LOT 1
P. M.
Nº
1513
42070


P.C. 8673 PAGE 4
COLLECT CHARGES AS INDICATED
Orig. Surface over Sewer
Finish Grade over Sewer
8" V.C.P. 0.60%
327.57'
455
450
445
17
18
19
20
21
42071
POMONA
FREEWAY
P. M.
Nº
1513
NO CHARGE FOR CONNECTION
LOT 1
COLLECT REIMBURSEMENT CHARGE CALL SANITATION DIVISION
Future curb line (Private Street)
BY=17+27.0
NO CHARGE FOR CONNECTION
LOT 1
P. M.
Nº
1513
PART OF RANCHO LA PUENTE AS PARTITIONED BY THE REFEREES SCC. 5800 C.F. 170

B.M. B.G. 3887 ELEV. 471.494

R.D.B.M. tag in curb 5 feet So. of B.C.R., 60 feet So. & 42 feet E. of ℄ of intersection of Nogales Street & Daisetta Street.

OTTERBEIN QUAD. 1970

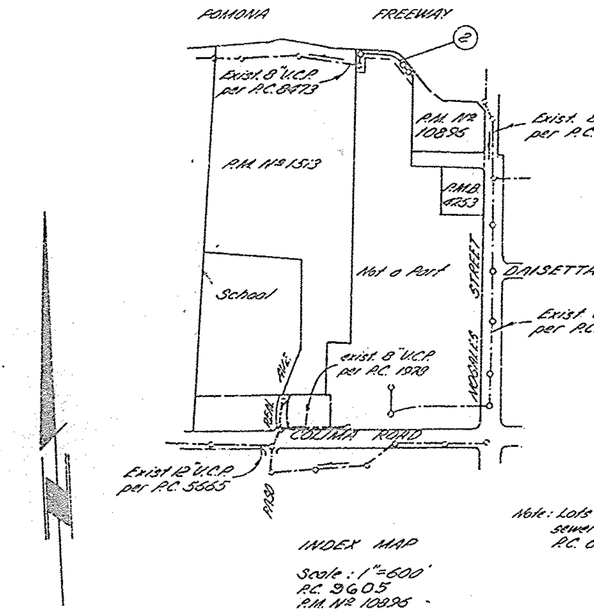
REVISION No 1 DATE June 24, 1981

Relocated manhole from Sta 4+50 to 4+35 on page 2.

APPROVED: Dean E. Hillman 6-24-81
Office of County Engineer RE. No 25559

NO CONNECTION FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS UNTIL A PERMIT FOR INDUSTRIAL WASTE WATER DISCHARGE HAS BEEN ISSUED BY THE SANITATION DISTRICTS FOR SAID CONNECTION.

BEFORE BREAKING INTO OR CONSTRUCTION ON A COUNTY SANITATION DISTRICT SEWER AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT SANITATION DISTRICT INSPECTOR SHALL BE NOTIFIED BY PHONE 962-8695 SO THAT REQUIRED INSPECTION CAN BE MADE.



INDEX MAP
Scale: 1"=600'
P.C. 9605
P.M. No 10896

PRIVATE ENGINEER'S NOTICE TO CONTRACTOR

The Contractor shall notify all utility companies prior to construction of improvements shown on this plan. The location of known underground utility pipes or structures shown on the sewer plan was obtained by a search of available records. To the best of my knowledge, there are no existing utilities, except as shown thereon.

The Contractor is required to take due precautionary measures to protect the utility lines shown and any other lines not of record or not shown on the plan.

Michael T. Scott September 19, 1978
Michael T. Scott, R.C.E. 23199 Date

Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this Project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner and the Engineer harmless from any and all liability, real or alleged, in connection with the performance of work on this Project, excepting for liability arising from the sole negligence of the Owner or the Engineer.

GENERAL NOTES:

1. ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.
2. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
3. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
4. GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
5. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND "Y" OR "T" BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
6. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
7. BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L.A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 1, AND PAY A FEE TO THE COUNTY ENGINEER, 201 E. Bonita Ave., San Dimas REGIONAL OFFICE, TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
8. IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.
9. APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
10. REFER TO SECTION 7-10.4.1 OF THE STANDARD SPECIFICATIONS, REGARDING SAFETY ORDERS.
11. Prior to issuance of the required sewer construction permit by the County Engineer, the contractor shall obtain a permit to excavate from the State of California Department of Industrial Relations, Division of Industrial Safety, and shall file a certificate of workers compensation insurance with the County Engineer.

CONSTRUCTION NOTES:

1. WORK SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (1976 EDITION with 77-78 supplements AND COUNTY ENGINEER SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWERS DATED Sept. 21, 1976 AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.
2. THE CONTRACTOR SHALL NOTIFY THE Environmental Development Division phone 213-974-7283 at least twenty-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
3. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE EXCEPT AS NOTED.
4. WYE OR TEE BRANCHES MAY BE USED FOR CONNECTIONS TO MAINLINE SEWERS EXCEPT AS NOTED.
5. ALL STRUCTURES SHALL BE EITHER BRICK MANHOLES PER S-3 OR PRECAST CONCRETE MANHOLES PER S-36, EXCEPT AS NOTED.
6. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
7. MANHOLE TOPS IN UNIMPROVED RIGHTS OF WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
8. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "D", "F", OR "G" PER STANDARD SPECIFICATIONS SECTION 208-2.
9. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-23, CASE II, TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE.
10. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-23, CASE II UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
11. ALL JOINTS BETWEEN CAST IRON PIPE AND VITRIFIED CLAY PIPE SHALL BE MADE WITH A RUBBER SLEEVE JOINT, TYPE "C" OR "D", (WITH BUSHING IF NECESSARY) PER STANDARD SPECIFICATIONS, SECTION 208-2.
12. SEWERS TO BE TESTED FOR LEAKAGE PER SECTION 306-2.14 OF THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
13. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
14. FULL COMPLIANCE WITH SECTION 306-1.36 OF THE SPECIAL PROVISIONS WILL BE REQUIRED FOR BACKFILL IN STREETS. CERTIFICATION OF BACKFILL COMPACTION AND SAND EQUIVALENTS BY A QUALIFIED, REGISTERED TESTING LABORATORY SHALL BE PROVIDED BY THE PERMITTEE PRIOR TO THE ISSUANCE OF A CERTIFICATE OF PARTIAL ACCEPTANCE.

PROFILE, ALIGNMENT AND GRADE OF

SANITARY SEWERS

TO BE CONSTRUCTED IN
PARCEL MAP No 10896
AND
RIGHTS OF WAY

PRIVATE CONTRACT NO. 9605

W.S. 38
1 SHEET ; 2 PAGES
49478

SCALE: VERT. 1"—4' HORIZ. 1"—40' OCTOBER, 1978

PREPARED IN THE OFFICES OF
H.M. SCOTT & ASSOCIATES, INC.
BY: Michael T. Scott
REG. C. E. No. 23199

THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF THE COUNTY ENGINEER SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT:

LEGEND	S-1
MINIMUM PUBLIC SAFETY REQUIREMENTS	S-2
BRICK MANHOLE	S-3
STANDARD MANHOLE STEP	S-17
BEDDING FOR SEWER PIPE	S-21
CRADLING AND ENCASEMENT	S-23
WYE OR TEE SUPPORT	S-26
ALLOWABLE TRENCH WIDTHS	S-33
LOCKING MANHOLE FRAME AND COVER	S-35
NON-REINFORCED PRECAST CONCRETE MANHOLE	S-36

COUNTY OF LOS ANGELES, CALIFORNIA

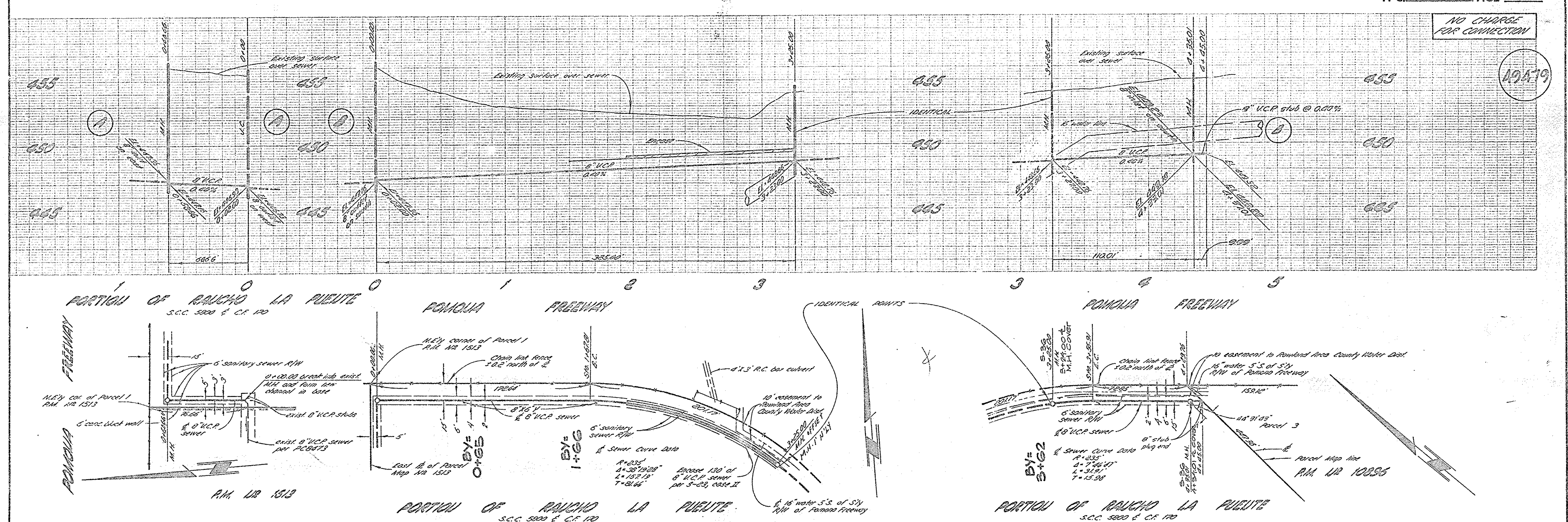
STEPHEN J. KOONCE, COUNTY ENGINEER — W. E. GARRISON, CHIEF ENGINEER, CO. SAN DIST. NO. 21

APPROVED Gordon W. Kriegel 7-12-79 (DATE) — APPROVED Frank L. Dain 7/25/79 OFFICE ENGINEER

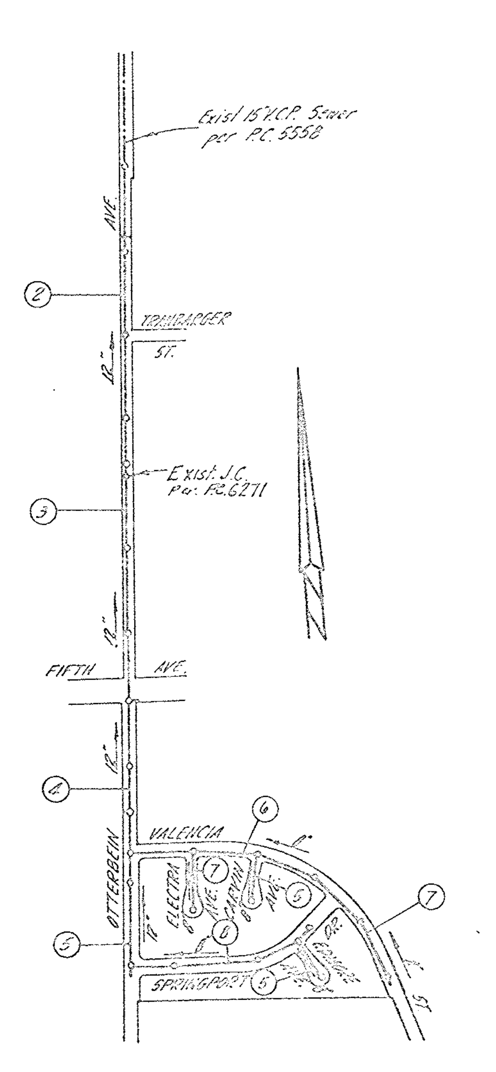
CHECKED Bernard L. Valesky 7/12/79 (DATE)

REG. C.E. NO. 10653

LA PUENTE BLDG. DIST. 2 — J. N. 035811



L.A. COUNTY SEWER SHEET NO. 1 SOUTHERN CALIFORNIA BLUEPRINT CO.



INDEX MAP
TRACT No 26978
P.C. 6127
SCALE 1"=400'

Bench Mark
S.G. 1846 Elev. 546.836 Otterbein Quad 1955
R.D. BM tag @ S.W. cor. conc. ret. wall @ N.E. cor. Valencia St.
℄ Otterbein Ave. ± 28' N. ℄ ± 28' E. c/L int.

PUENTE BLDG. DIST. NO. 2

NOTES:

1. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
2. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF TH' WORK.
3. THE OWNER OR HIS AUTHORIZED REPRESENTATIVE SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND Y BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ANY CHANGE IN LOCATION SHALL BE REQUESTED IN WRITING BY THE OWNER OR HIS REPRESENTATIVE
4. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
5. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
6. USE STANDARD MANHOLE FRAMES AND COVERS, S-a-117.
7. USE EXTRA STRENGTH PIPE, ALL PIPE STANDARD DEPTH, EXCEPT AS NOTED.
8. USE CEMENT MORTAR OR "WEDGE-LOCK" OR "SPEED-SEAL" FOR ALL V.C.P. JOINTS PER SPEC'S., SECS. 36 & 48.
9. RESURFACE ALL TRENCH WITHIN PAVED AREA TO MEET L.A. COUNTY ROAD DEPT. OR CALIF. STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
10. ENCASE FOUR FEET OF SEWER AT POINTS OF INTERFERENCE WITH POLES, CASE III, S-a-172.
11. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 6 FEET BELOW CURB GRADE.
12. MANHOLES. SHALL BE BRICK SEWER STRUCTURES, S-a-104. PRECAST CONCRETE MANHOLES PER S-a-185 OR S-a-173 MAY BE USED AS AN ALTERNATE IN LOCATIONS APPROVED BY THE COUNTY ENGINEER.
13. FOR ALLOWABLE LEAKAGE TEST USE FORMULA NO. 1, SPEC'S., SEC. 54.
14. MANHOLE TOPS IN UNIMPROVED RIGHTS-OF-WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
15. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE, MADISON 9-4747, EXT. 81551 AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
16. STANDARD SPECIFICATIONS DATED OCTOBER 25, 1961 APPLY IN THE CONSTRUCTION OF THIS PROJECT.

COLLECT CHARGES
AS INDICATED
Lionel H. Kenny 4-4-62

NO CONNECTIONS FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS WITHOUT WRITTEN PERMISSION FROM THE CHIEF ENGINEER AND GENERAL MANAGER OF THE COUNTY SANITATION DISTRICTS.

PROFILE ALIGNMENT AND GRADE OF P.C. 6127

SANITARY SEWERS PAGE 1

TO BE CONSTRUCTED IN J.N. 0357.55

TRACT No 26978
AND IN OTTERBEIN AVE.
AND IN VALENCIA ST.

PRIVATE CONTRACT NO. 6127

W.S. 38

4 SHEETS; 8 PAGES

31967

SCALE: VERT. 1"—4' HORIZ. 1"—40' FEBRUARY, 1962

PREPARED IN THE OFFICES OF
ADAMS & ELLS
CIVIL ENGINEERS

By: William C. D.
REG. C. E. NO. 10880

FOR LEGEND SEE PLAN NO. S-A-64

NOTE:

GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.

ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.

THIS DRAWING AND THE DATA HEREON ARE HEREBY MADE A PART OF THE SPECIFICATIONS.

WORK SHALL BE CONSTRUCTED ACCORDING TO SPECIFICATIONS ON FILE IN THE OFFICE OF THE COUNTY ENGINEER AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.

BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L. A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 1, AND PAY A FEE TO THE COUNTY ENGINEER, ROOM 310, COUNTY ENGINEER BLDG., 108 W. 2ND ST. SUFFICIENT TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.

APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.

IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET.

COUNTY OF LOS ANGELES, CALIFORNIA

APPROVED, JOHN A. LAMBIE, COUNTY ENGINEER

APPROVED, JOHN D. PARKHURST, CHIEF ENGINEER

CO. SAN. DIST. NO. 21

BY Richard E. Kuhn
ASS'T. SANITATION ENGINEER

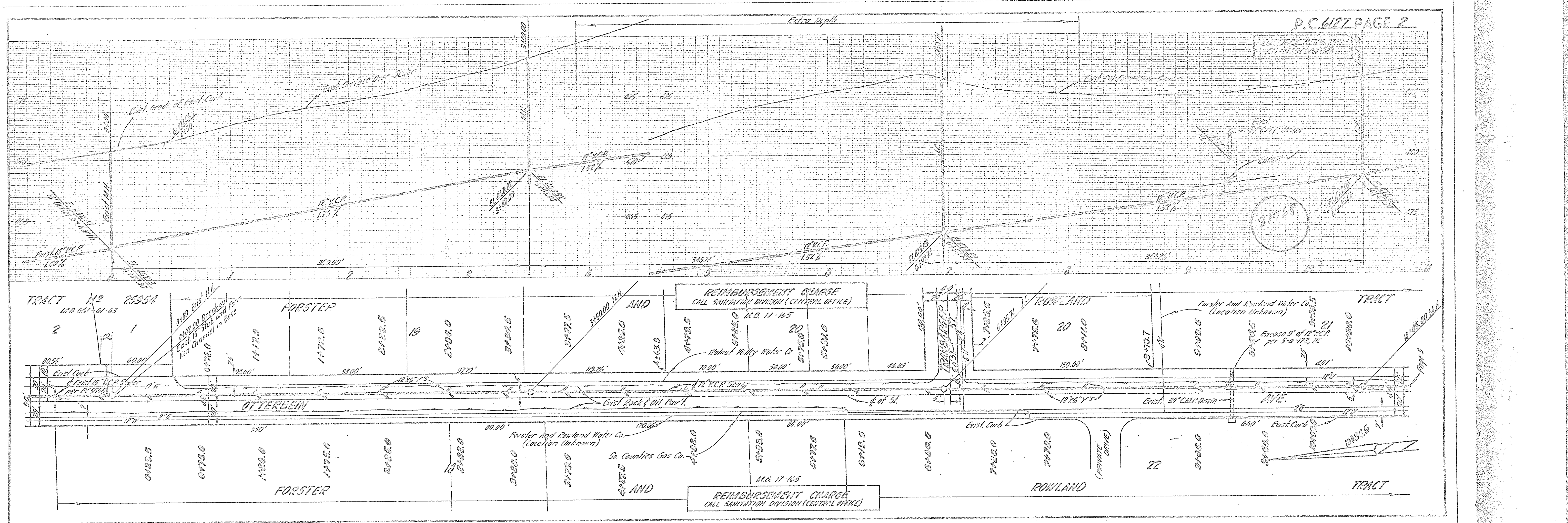
BY E. P. Bennett
OFFICE ENGINEER

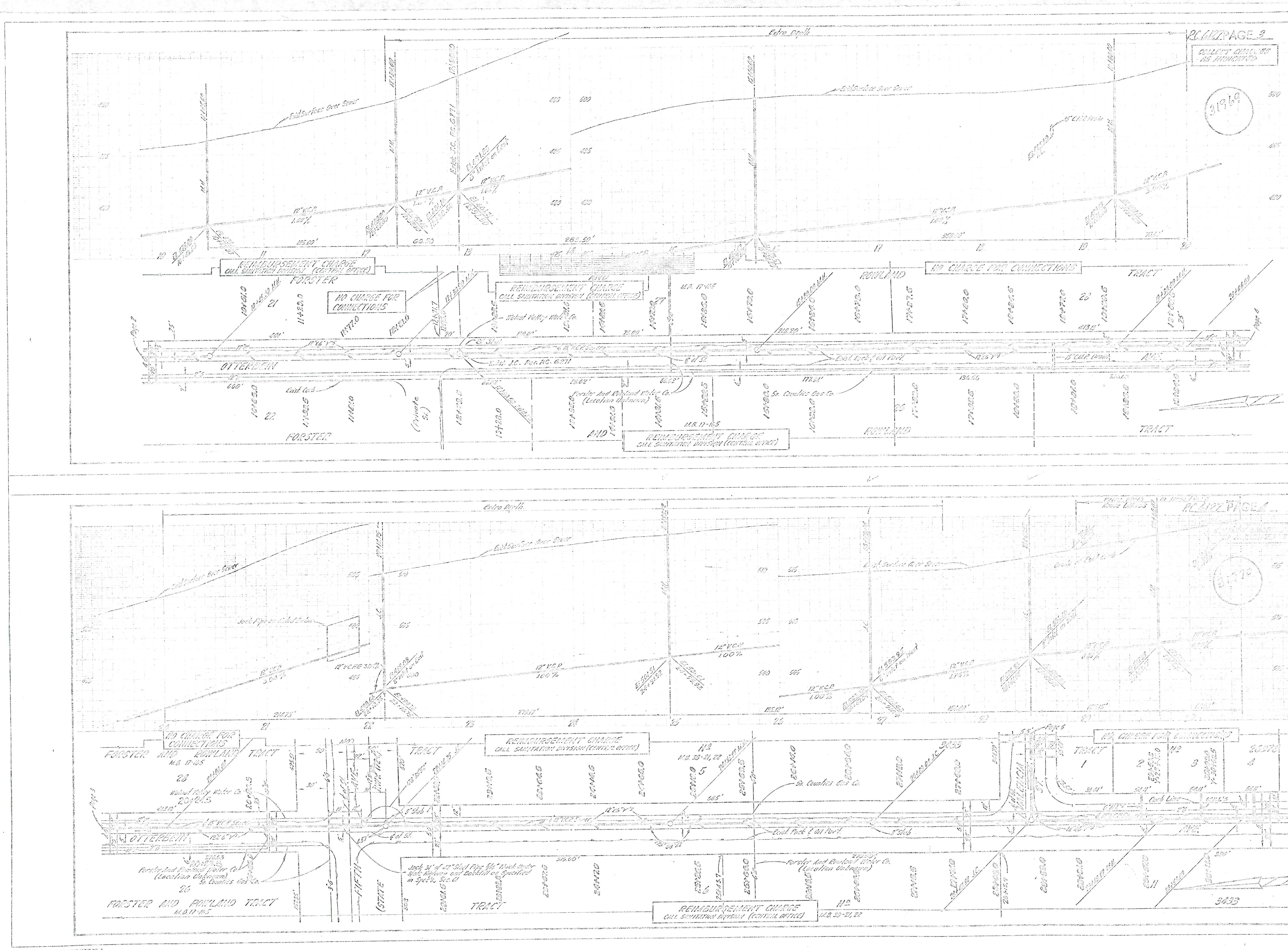
CHECKED BY H. Weida 4-5-62

OFFICE OF COUNTY ENGINEER, REG. C. E. NO. 9406

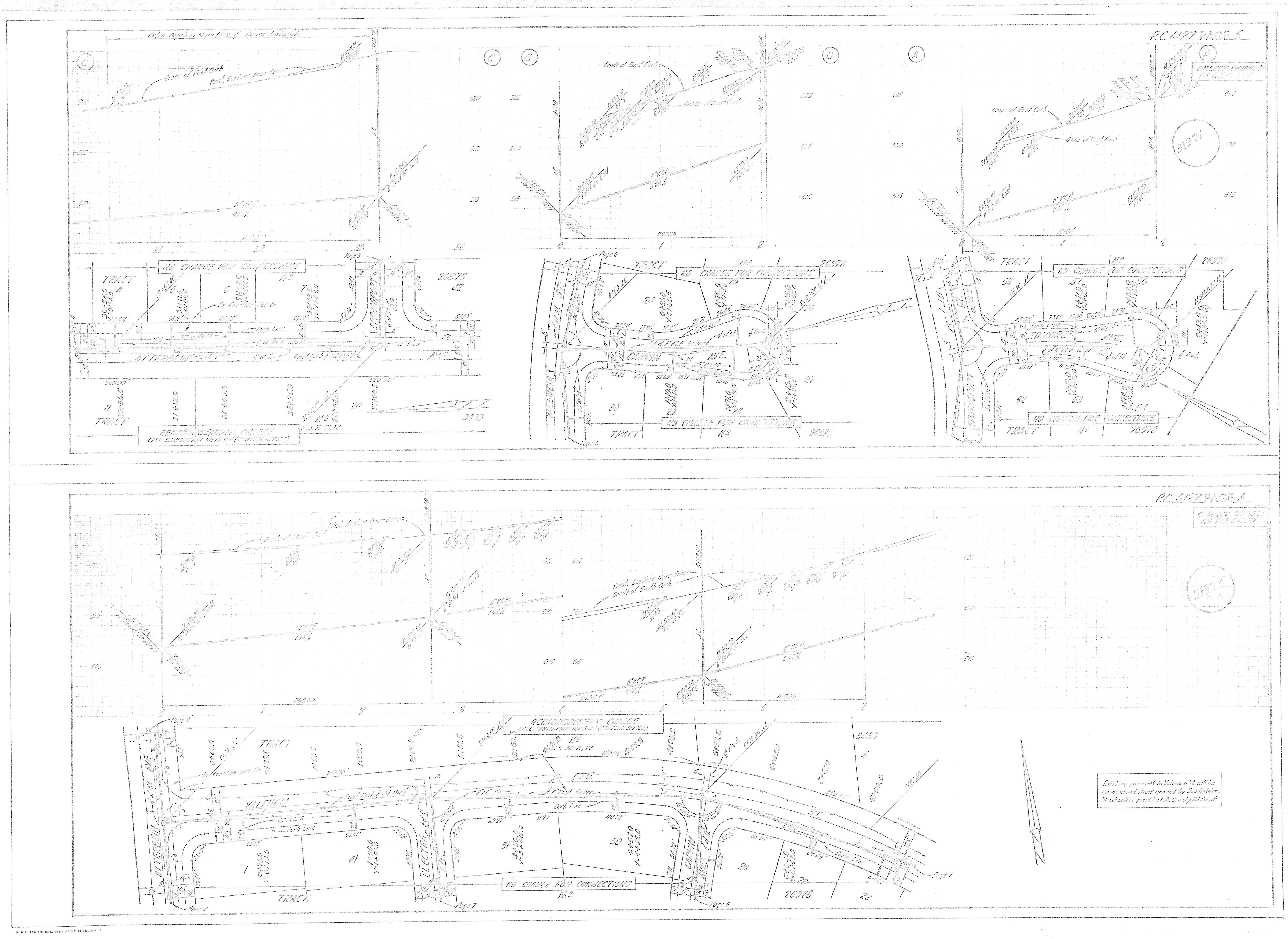
SUBMITTED: W. C. Poindexter
SAN DIMAS REGIONAL ENGINEER

P.C. 6127 PAGE 2

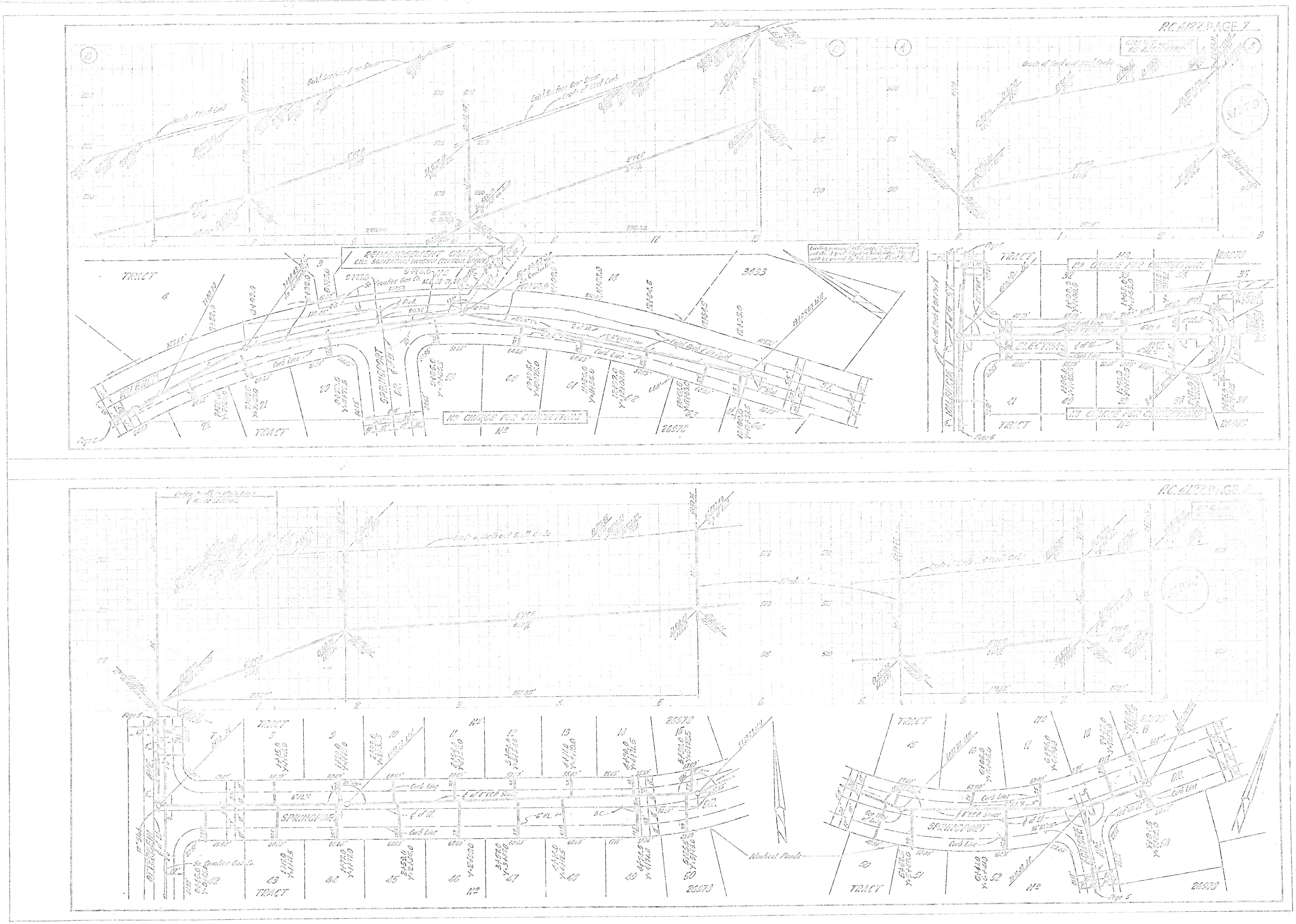


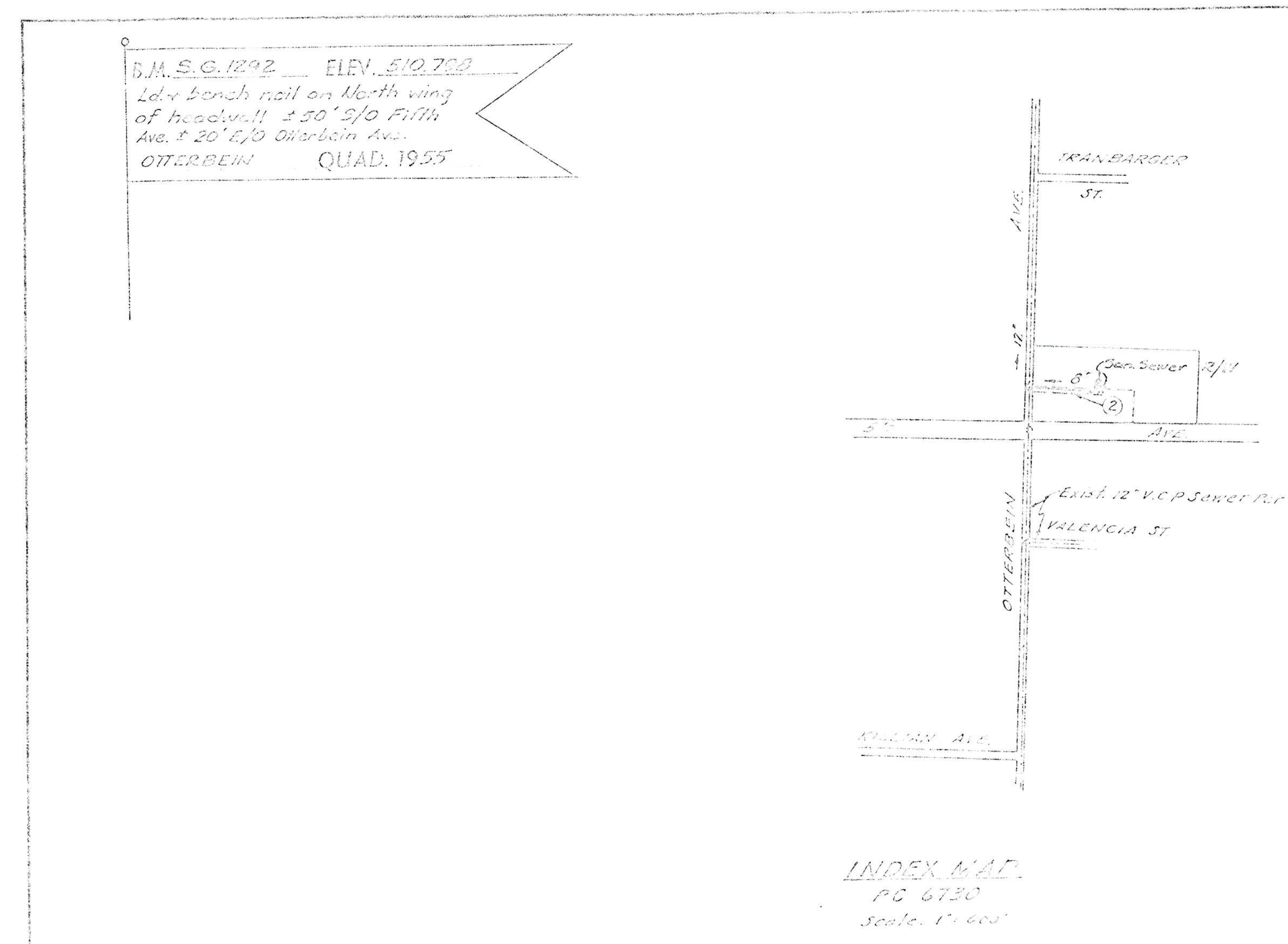


PC 6177 PAGE 3
COLLECT CHARGES AS INDICATED
Extra Depth
REIMBURSEMENT CHARGE
CALL SANITATION DIVISION (CENTRAL OFFICE)
NO CHARGE FOR CONNECTIONS
FORSTER
ROWLAND
TRACT
OTTERBEIN
AVE
M.B. 17-165
So. Counties Gas Co.
Forster And Rowland Water Co. (Location Unknown)
Walnut Valley Water Co.
PC 6177 PAGE 4
FORSTER AND ROWLAND TRACT
12" V.C.P.
FIFTH
STATE
M.B. 33-21, 22



P.C. 6127 PAGE 5
P.C. 6127 PAGE 4
NO CHARGE FOR CONNECTIONS
REIMBURSEMENT CHARGE
TRACT
Nº
26978
Existing pavement in Valencia St. will be removed and street graded by Subdivider. Street will be paved by L.A. County Rd. Dept.


P.C. 6122 PAGE 7
REIMBURSEMENT CHARGE
TRACT
SPRINGPORT DR.
ELECTRA
NO CHARGE FOR CONNECTIONS
P.C. 6122 PAGE 7
TRACT
SPRINGPORT



LA PUENTE BLDG. DIST. NO. 2

NOTES.

1. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE & THE CENTER LINE OF EACH MANHOLE.
2. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
3. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL ~~HOUSE LATERALS AND~~ Y BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ~~ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.~~
4. ~~THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.~~
5. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
6. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE, MADISON 9-4747, EXT. 81151, AT LEAST TWENTY FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
7. MANHOLES SHALL BE BRICK SEWER STRUCTURES PER S-a-104. PRECAST CONCRETE MANHOLES PER S-a-135 OR S-a-173 MAY BE USED AS AN ALTERNATE IN LOCATIONS APPROVED BY THE COUNTY ENGINEER.
8. USE STANDARD MANHOLE FRAMES AND COVERS, S-a-117.
9. MANHOLE TOP IN UNIMPROVED RIGHT OF WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
10. USE EXTRA STRENGTH PIPE. ALL PIPE IS STANDARD DEPTH EXCEPT AS NOTED.
11. USE MECHANICAL COMPRESSION JOINTS FOR ALL V.C.P. PER SPEC'S, SECS 36 & 48. IN MAINLINE
12. WHERE EVER GROUND WATER IS ENCOUNTERED DURING THE CONSTRUCTION OF THE SEWERS, THE V.C.P. JOINTS SHALL BE OF JOINT COMPOUND PER SPEC'S, SECS 33 & 48, OR MECHANICAL COMPRESSION JOINTS PER SPEC'S, SEC. 36.
13. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-a-172, CASE III, TWO FEET ON EITHER SIDE FROM THE POINT OF INTERFERENCE.
14. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-a-172, CASE III, UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
15. ~~HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE ------- FEET BELOW CURB GRADE EXCEPT AS NOTED.~~
16. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
17. FOR ALLOWABLE LEAKAGE TEST USE FORMULA NO. 2, SPEC'S, SEC. 54
18. ALL STATE & LOCAL TRENCH SAFETY ORDERS WILL BE RIGIDLY ENFORCED.

APPROVED:
Joseph B. Garnick DATE: 6-8-64
INDUSTRIAL WASTE DIVISION

COLLECT CHARGES AS INDICATED
[signature] 6/64

NO CONNECTIONS FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS WITHOUT WRITTEN PERMISSION FROM THE CHIEF ENGINEER AND GENERAL MANAGER OF THE COUNTY SANITATION DISTRICTS.

PROFILE ALIGNMENT AND GRADE OF

P.C. 6730

SANITARY SEWERS

PAGE 1

TO BE CONSTRUCTED IN

OTTERBEIN AVENUE R/W

PRIVATE CONTRACT NO. 6730

W.S. 38

1 SHEET - 2 PAGES

SCALE: VERT. 1" = 4' HORIZ. 1" = 40' APRIL, 1964

34949

PREPARED IN THE OFFICES OF

By: Bruce A. Packard
REG. C. E. NO. 13801

FOR LEGEND SEE PLAN NO. S-a-64

NOTE

GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.

ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.

THIS DRAWING AND THE DATA HEREON ARE HEREBY MADE A PART OF THE SPECIFICATIONS.

WORK SHALL BE CONSTRUCTED ACCORDING TO STANDARD SPECIFICATIONS DATED MAY 26, 1958, ON FILE IN THE OFFICE OF THE COUNTY ENGINEER AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.

BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L.A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. 1 AND PAY A FEE TO THE COUNTY ENGINEER, ROOM 300, COUNTY ENGINEER BLDG BUILDING, 108 WEST SECOND STREET OR SAN DIMAS REGIONAL OFFICE, SUFFICIENT TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.

APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.

IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.

COUNTY OF LOS ANGELES, CALIFORNIA

JOHN A. LAMBIE, COUNTY ENGINEER — J. D. PARKHURST, CHIEF ENGINEER

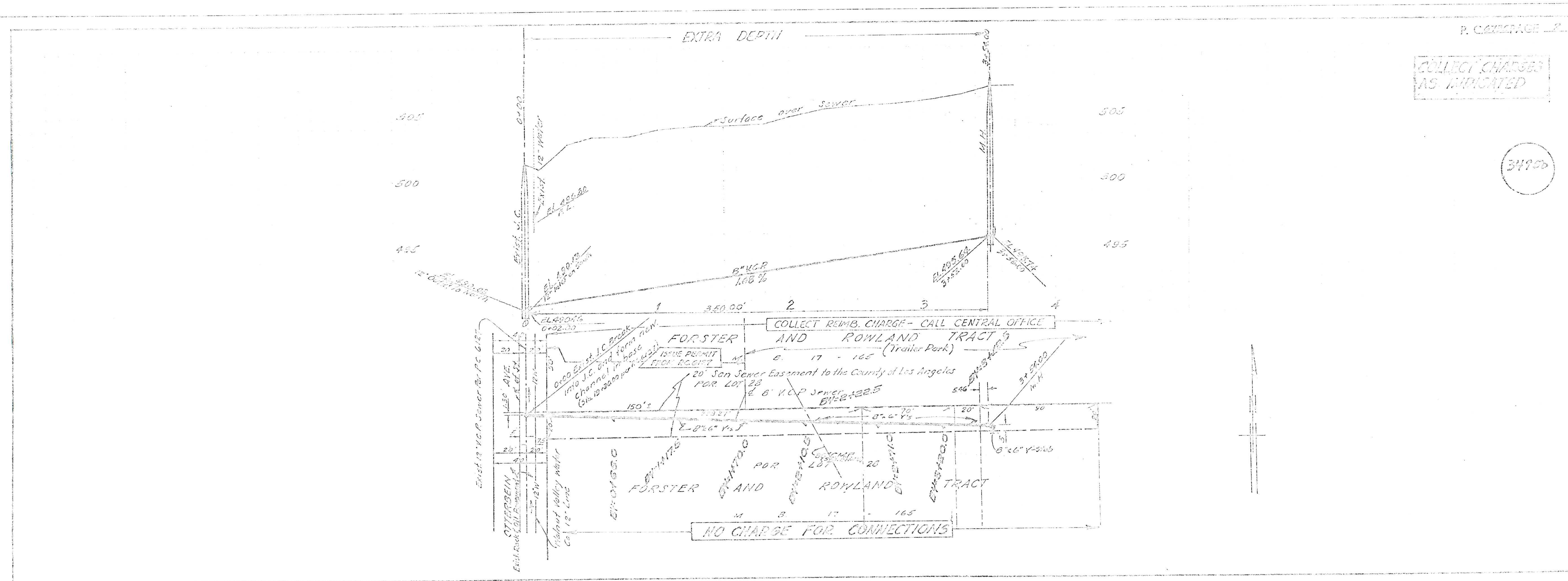
CO. SAN. DIST. NO. 21

APPROVED BY, [signature] ASSISTANT SANITATION ENGINEER — APPROVED BY, [signature] OFFICE ENGINEER

SUBMITTED BY, Gordon W. Kreigel SAN DIMAS REGIONAL ENGINEER

CHECKED BY, B. F. Hoeling 6-10-64
REG. C.E. NO. 11635

J. N. [illegible]



L.A. COUNTY SEWER SECT ...

J-2: WATER SUPPLY AVAILABILITY SUPPORTING INFORMATION

ROWLAND WATER DISTRICT

BOARD OF DIRECTORS

Szu Pei Lu-Yang
President

John E. Bellah
Director

Anthony J. Lima
Director

Robert W. Lewis
Vice President

Teresa P. Rios
Director

Thomas L. Coleman
General Manager

David Warren
Director of Operations

Rosemarie Perea
Director of Administrative Svcs.

September 2, 2015

Ms. Anne R. Doehne
PCR Services Corporation
80 South Lake Avenue, Suite 570
Pasadena, CA 91101

RE: Service Address: 18800 Gale Avenue, Rowland Heights, CA

Dear Ms. Doehne:

The proposed water system for the above-captioned property will be operated by:

Rowland Water District
3021 South Fullerton Road
Rowland Heights, CA 91748

This Will Serve Letter is valid for six (6) months from the above-captioned date.

Yours truly,

Tom Coleman

TOM COLEMAN
General Manager

ROWLAND WATER DISTRICT
BOARD OF DIRECTORS
Szu Pei Lu-Yang
President
Robert W. Lewis
Vice President
John E. Bellah
Director
Anthony J. Lima
Director
Teresa P. Rios
Director
Thomas L. Coleman
General Manager
David Warren
Director of Operations
Rosemarie Perea
Director of Administrative Svcs.

October 7, 2015

Ms. Julianne Frabizio, PE, QSD
Thienes Engineering, Inc.
14349 Firestone Boulevard
La Mirada, CA 90638

RE: Gale Avenue Project Water Supply Analysis Determination

Dear Ms. Frabizio:

Upon review of the proposed Gale Avenue Project, the District has determined that a Water Supply Analysis is not required for the following reasons:

In accordance with SB 610, the project must be subject to CEQA and must meet the definition of a project pursuant to CWC Section 10912. Section 10912 states that a project must:

- Be a hotel with >500 rooms
- Have retail space >500,000 sq. ft.
- Have > 250,000 sq. ft. of office space
- Demand water ≥ what would be required by a 500 dwelling unit (DU) project

For this project, there are 477 hotel rooms, 9,500 sq. ft. of office space and ~51,500 sq. ft. of retail space, which are all below the requirements listed above. Since it is a mixed use project, we also applied the 500 DU test with the following assumptions: 500 DUs with an average occupancy rate of 3.36 people/DU (per 2010 census) and either 177 gpcd or 196 gpcd (using the baseline and 2015 target gpcd numbers from the Rowland Water District 2010 UWMP). For the project to exceed the 500 DU Demand Water it would need to use an equivalent of between 297,360 gpd and 329,280 gpd. Based on what was provided for sewer flow rates, the project would use an estimated 129,882 gpd minimum, well below the 500 DU equivalent. Since the projected water use of the project is less than either of these numbers, this does not fit the definition of a project under SB 610.

In an abundance of caution, please be advised that the District is currently under a Water Supply Allocation Plan (WSAP) from Metropolitan Water District that was implemented in April, 2015. The WSAP requires the District to reduce its annual purchased water by 15% below its 2014 water purchases. Based on whether the WSAP is still in place, the changes that may develop in the current water culture, and the ongoing drought, the District may require this project to have a neutral water demand.

Please feel free to call me to discuss this further if you have any questions.

Yours truly,

DAVE WARREN
Director of Operations

3021 S. Fullerton Road • Rowland Heights, CA 91748 • Ph: (562) 697-1726 • www.rowlandwater.com

ROWLAND WATER DISTRICT

BOARD OF DIRECTORS

Szu Pei Lu-Yang
President

John E. Bellah
Vice President

Robert W. Lewis
Director

Anthony J. Lima
Director

Teresa P. Rios
Director

Ken Deck
General Manager

Ted Carrera
Assistant General Manager

Janet Morningstar
Legal Counsel

January 27, 2014

Ms. Jill Johnson
Thienes Engineering, Inc.
14349 Firestone Blvd
La Mirada, CA, 90638

RE: <u>Job # 3090b – 18800 Railroad St, City of Industry, CA   APN 8264021020</u>

Gentlemen:

We hereby state that the proposed water system for the above-captioned property will be operated by:

Rowland Water District
3021 South Fullerton Road
Rowland Heights, CA 91748

The facilities of the Rowland Water District are adequate during normal operating conditions to meet the requirements for the water system of this subdivision.

Yours truly,

KEN DECK
General Manager

P.O. BOX 8460 • 3021 S. FULLERTON ROAD • ROWLAND HEIGHTS, CA 91748 • PH: (562) 697-1726 • WWW.ROWLANDWATER.COM

County of Los Angeles
Department of Regional Planning
Land Divisions Section
320 West Temple Street
Los Angeles, California 90012