

Appendix H

Traffic Impact Study;

Traffic Memorandum - Mango Ave Replacement Site; and

Traffic Memorandum - Palmetto Ave Replacement Site

TRAFFIC IMPACT STUDY
FOR THE PROPOSED
SIERRA AND CASA GRANDE WAREHOUSE
IN THE CITY OF FONTANA

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May, 2020

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TRAFFIC IMPACT STUDY
FOR THE PROPOSED
SIERRA AND CASA GRANDE WAREHOUSE
IN THE CITY OF FONTANA

INTRODUCTION

Purpose and Study Objectives

This traffic impact study has been prepared to address the traffic-related impacts of the proposed Sierra and Casa Grande Warehouse project in the City of Fontana. This traffic study has been conducted in accordance with the traffic study requirements of the City of Fontana and San Bernardino Association of Governments (SANBAG) Congestion Management Program (CMP).

This report includes a description of existing traffic conditions in the surrounding area, estimated project trip generation and distribution, future traffic growth, and an assessment of project-related impacts on the roadway system. Where necessary, circulation system improvements have been identified to mitigate significant project impacts at the study locations.

Project Overview

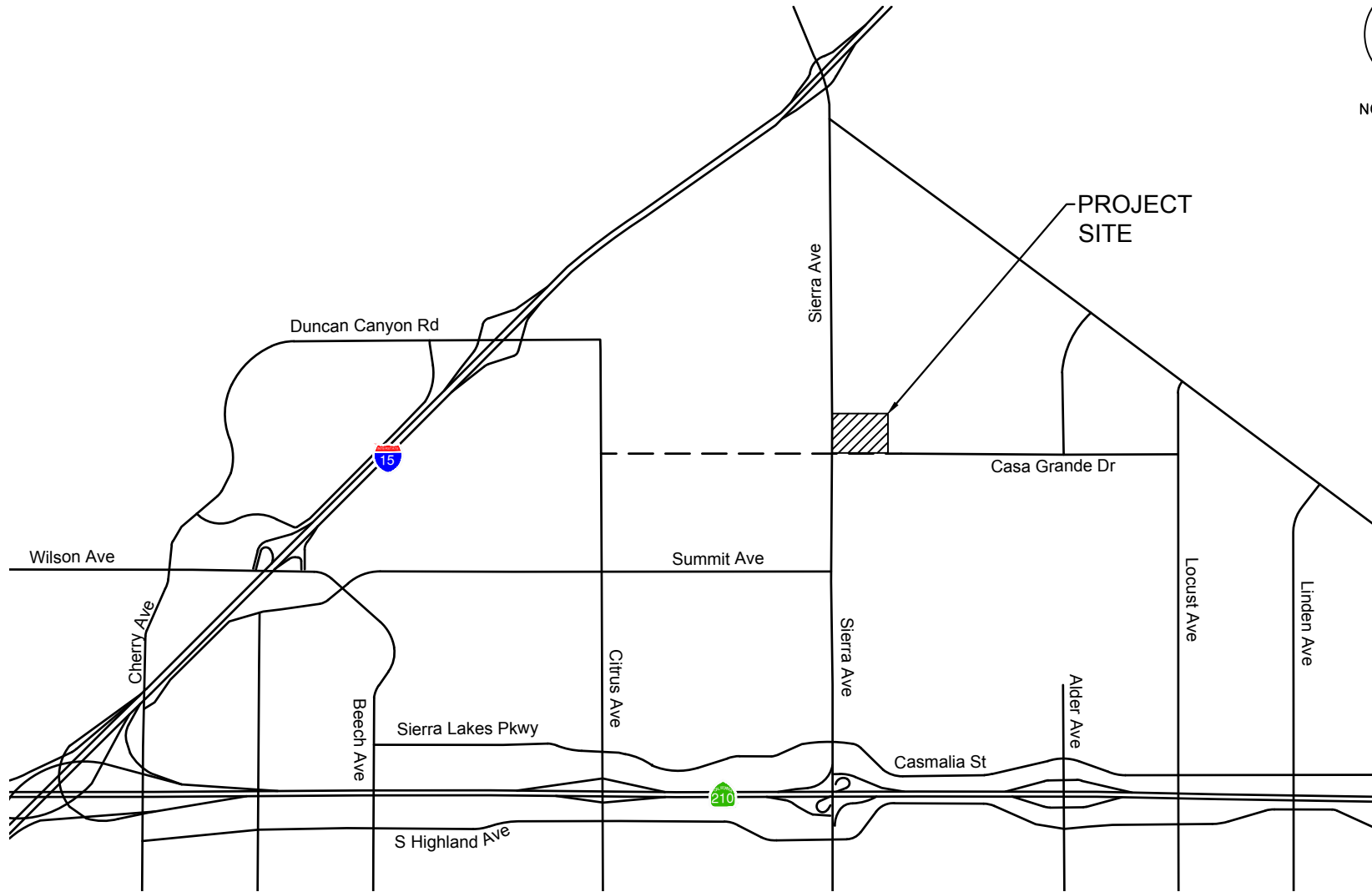
The project is located on the northeast corner of the future intersection of Sierra Avenue and Casa Grande Drive, in the northern area of the City of Fontana. The project site is shown in its regional setting on Figure 1. The project site (approximately 15.2 acres) is currently bounded by vacant land to the north and south, Sierra Avenue to the west, and single-family residential uses to the east.

The project consists of the construction of a 332,996 square-foot warehouse with 134 parking stalls, 67 trailer parking stalls as well as 35 loading docks. A copy of the project site plan is provided on Figure 2.

Vehicular access for the project site would be via two full-movement driveways on Sierra Avenue, one right-in/right-out driveway and one full-movement driveway on Casa Grande Drive. All four project driveways would be unsignalized. Passenger vehicles would access the project site via the two driveways on the Sierra Avenue and trucks would access the project site via the two driveways on Casa Grande Drive.



NOT TO SCALE



LEGEND:

— — — = Future Roadway

**FIGURE 1
VICINITY MAP**

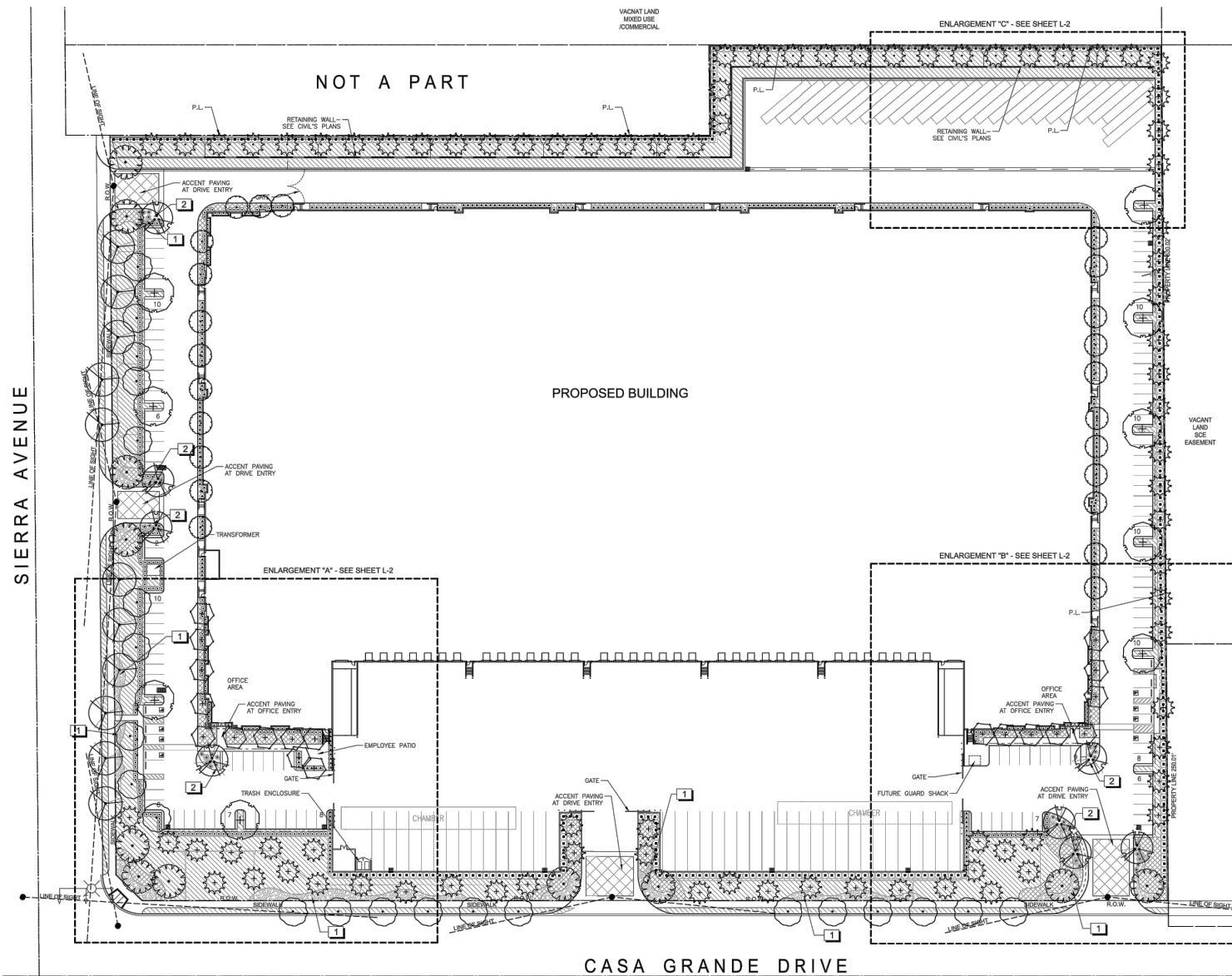


FIGURE 2
PROJECT SITE PLAN

ANALYSIS SCENARIOS AND METHODOLOGY

Analysis Scenarios

Based on the City of Fontana's Traffic Impact Analysis (TIA) guidelines, the project will be evaluated in the morning and evening peak hours for the following conditions:

- Existing Conditions
- Existing Plus Project
- Project Opening Year 2021
- Project Opening Year 2021 Plus Project
- Horizon Year 2040
- Horizon Year 2040 Plus Project

Intersection Analysis – HCM Methodology

This study includes evaluation of morning and evening peak hour operations at two existing intersections, one future intersection, and the project site driveways, located in the City of Fontana.

Peak hour intersection operations at signalized and unsignalized intersections were evaluated using the methods prescribed in the current Highway Capacity Manual (HCM) 6th edition, consistent with the requirements of the 2016 San Bernardino County CMP.

The City of Fontana's TIA guidelines require analysis of traffic operations to be based on the vehicular delay methodologies of the HCM (Transportation Research Board Special Report 209). The City does not designate a specific software to be used in the analysis but allows the use of one of several software packages that are consistent with the HCM methodologies. The intersection analysis for the proposed project has been accomplished using the Vistro software program and using the specified input parameters outlined in the San Bernardino County CMP.

Per the HCM Methodology, Level of Service (LOS) for signalized intersections is defined in terms of average vehicle delay. Specifically, LOS criteria are stated in terms of the average control delay per vehicle for the peak 15-minute period within the hour analyzed. The average control delay includes initial deceleration delay, queue move-up time, and final acceleration time in addition to the stop delay. The tables on the following page provide a description of the operating characteristics of each Level of Service and define the LOS in terms of average seconds of delay for signalized and unsignalized intersections.

LEVEL OF SERVICE DEFINITIONS	
Level of Service	Description
A	No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Typically, the approach appears quite open, turns are made easily and nearly all drivers find freedom of operation.
B	This service level represents stable operation, where an occasional approach phase is fully utilized and a substantial number are approaching full use. Many drivers begin to feel restricted within platoons of vehicles.
C	This level still represents stable operating conditions. Occasionally drivers may have to wait through more than one red signal indication, and backups may develop behind turning vehicles. Most drivers feel somewhat restricted but not objectionably so.
D	This level encompasses a zone of increasing restriction, approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak period; however, enough cycles with lower demand occur to permit periodic clearance of developing queues, thus preventing excessive backups.
E	Capacity occurs at the upper end of this service level. It represents the most vehicles that any particular intersection approach can accommodate. Full utilization of every signal cycle is seldom attained no matter how great the demand.
F	This level describes forced flow operations at low speeds, where volumes exceed capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially, and stoppages may occur for short or long periods of time due to the congestion. In the extreme case, both speed and volume can drop to zero.

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED AND UNSIGNALIZED INTERSECTIONS		
Level of Service	Signalized Intersection (Average delay per vehicle, in seconds) ¹	Unsignalized Intersections (Average delay per vehicle, in seconds) ²
A	≤ 10	0 – 10
B	> 10 – 20	> 10 – 15
C	> 20 – 35	> 15 – 25
D	> 35 – 55	> 25 – 35
E	> 55 – 80	> 35 – 50
F	> 80	> 50

¹ Source: Highway Capacity Manual (HCM 6th Edition), Exhibit 18-4.

² Source: Highway Capacity Manual (HCM 6th Edition), Exhibits 19-1 and 20-2.

Level of Service Standards and Measure of Significance

The Level of Service standard in the City of Fontana for an intersection is LOS C or better. According to the City of Fontana's TIA guidelines, a significant traffic impact would occur when the project causes the Level of Service to fall below LOS C, or causes the peak hour delay to increase as follows:

- LOS A/B – by 10.0 seconds
- LOS C – by 8.0 seconds
- LOS D – by 5.0 seconds
- LOS E – by 2.0 seconds
- LOS F – by 1.0 second

AREA CONDITIONS

Study Area

This traffic study includes documentation of existing conditions, future conditions, and identification of project-related impacts at the following study intersections:

1. Sierra Avenue at Casa Grande Drive (future intersection)
2. Sierra Avenue at SR-210 Westbound Ramp
3. Sierra Avenue at SR-210 Eastbound Ramp

The study locations were established in consultation with City of Fontana staff through the Scoping Letter Agreement process. A copy of the approved Scoping Letter Agreement is provided in *Appendix A*.

Existing Street System

Regional access to the site is provided primarily by the Foothill Freeway (SR-210). Access to the SR-210 Freeway via Sierra Avenue is located approximately 1.5 miles south of the project site. Another facility that provides regional access to the site includes the Interstate 15 (I-15) Freeway, with access to the freeway located approximately 3 miles to the west of the project site.

Existing lane configurations and intersection controls at the study intersections are shown on Figure 3. A copy of the City of Fontana's Hierarchy of Streets Plan is provided on Figure 4. The following provides a description of the roadways surrounding the project site.

Sierra Avenue – Sierra Avenue is a two-lane undivided roadway north of Summit Avenue, and a five-to-six-lane divided roadway south of Summit Avenue. Throughout the entire roadway within the study area, Sierra Avenue has left-turn lanes at arterial intersections. On-street parking on Sierra Avenue is not allowed. Sierra Avenue forms the western boundary of the project site and would provide passenger vehicle access to the site via two full-movement driveways. Sierra Avenue is designated as a Major Divided Highway on the City of Fontana Circulation Master Plan, which would

provide six travel lanes and a median with left turn pockets approaching intersections. This would ultimately only allow right-in/right-out driveways to the project along Sierra Avenue with the Horizon Year conditions.

Casa Grande Drive – Casa Grande Drive is a four-lane undivided roadway through the study area with bike lanes in both directions. On-street parking on Casa Grande Drive is not allowed. Casa Grande Drive will form the southern boundary of the project site and would provide truck access to the site via one western, right-in/ right-out driveway and one eastern, full-movement driveway.

Transit Service

Transit service to the project area is provided via the OmniTrans transit lines, which serve many San Bernardino cities in the area. The closest bus stop in the project vicinity is at the intersection of Sierra Avenue at Sierra Lakes Parkway, approximately 1 ¼ mile south of the project site. A description of the bus route serving the project area is provided below.

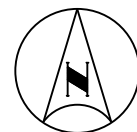
Route 82 operates between the City of Fontana and the City of Rancho Cucamonga, traveling through Fontana along Sierra Avenue and Jurupa Avenue. Route 82 operates on weekdays from approximately 4:30 AM to 10:15 PM with approximately 15-minute headways (the time between bus arrivals), on Saturdays from approximately 6:15 AM to 7:30 PM with approximately 30-minute headways, and on Sundays from approximately 6:15 AM to 7:10 PM with approximately 30-minute headways.

Existing Traffic Volumes

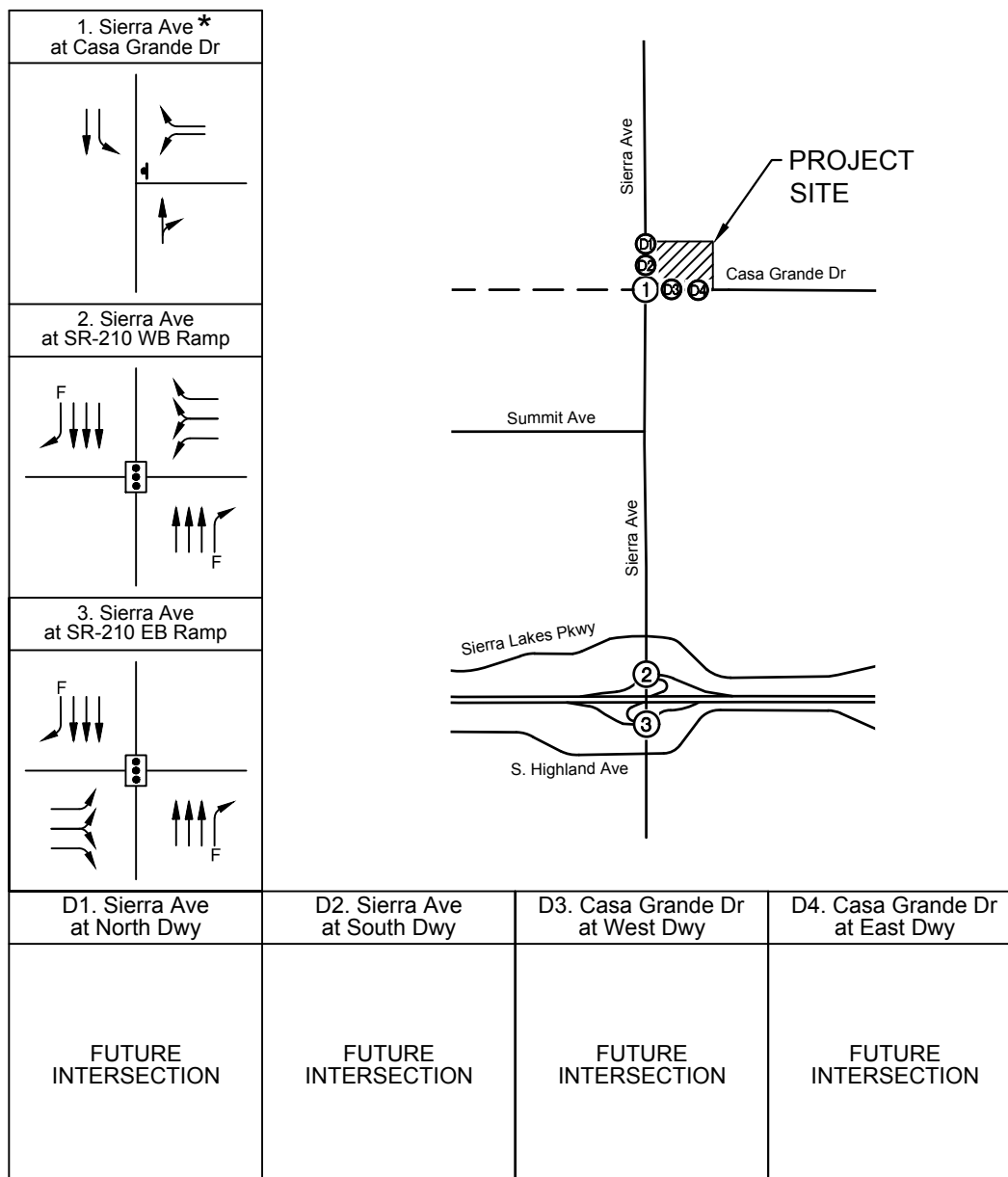
Existing morning and evening peak hour turning movement volumes and daily roadway volumes were collected on a typical weekday in September, 2019. The study intersection of Sierra Avenue at Casa Grande Drive is a future intersection. Volumes at this intersection were estimated based on existing daily roadway volumes. This intersection will be analyzed for Existing Plus Project and Future scenarios. Existing morning and evening peak hour volumes are presented on Figure 5. Peak hour intersection traffic count worksheets and daily roadway volume worksheets are provided in *Appendix B*.

Existing Peak Hour Operating Conditions

Intersection Level of Service analysis was conducted for the morning and evening peak hours using the analysis procedures and assumptions described previously in this report. The results of the intersection analysis for Existing Conditions are shown on Table 1. Copies of Existing Conditions intersection analysis worksheets are provided in *Appendix C*. Review of this table indicates that the all study intersections currently operate at an acceptable Level of Service under Existing Conditions.



NOT TO SCALE



* Sierra Avenue at Casa Grande Drive is a future intersection. Lane configuration and traffic control are assumed for Existing Plus Project conditions.

LEGEND:

- (X) = Study Intersection
- = Turn or Through Lane
- ⬢ = Signal
- ▲ = Stop Sign
- F = Free Right-Turn

FIGURE 3
EXISTING LANE CONFIGURATION
AND TRAFFIC CONTROL

City of Fontana, State of California
HIERARCHY OF STREETS PLAN
 ADOPTED WITH GENERAL PLAN ON TBD

DRAFT

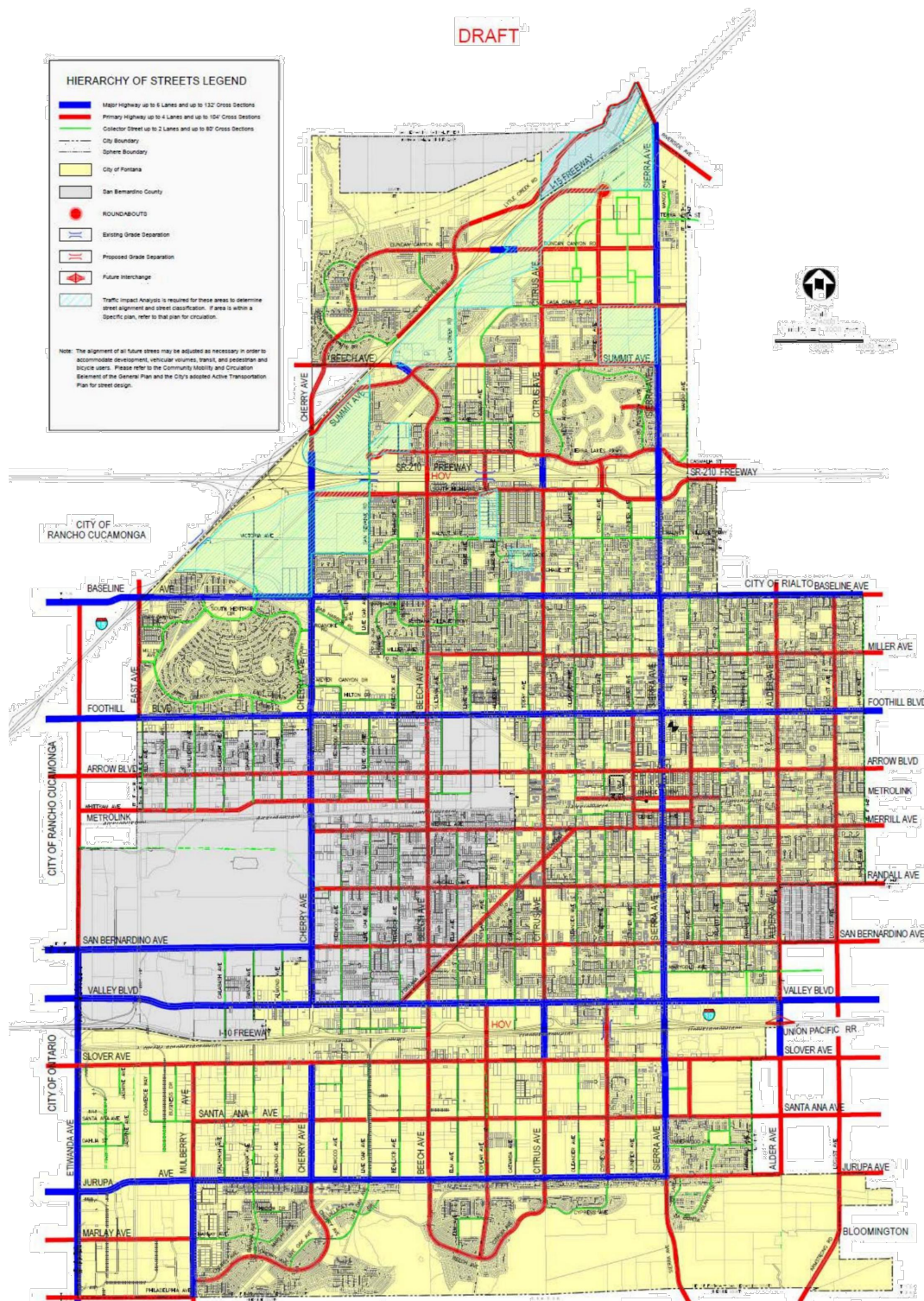
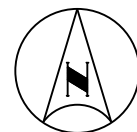
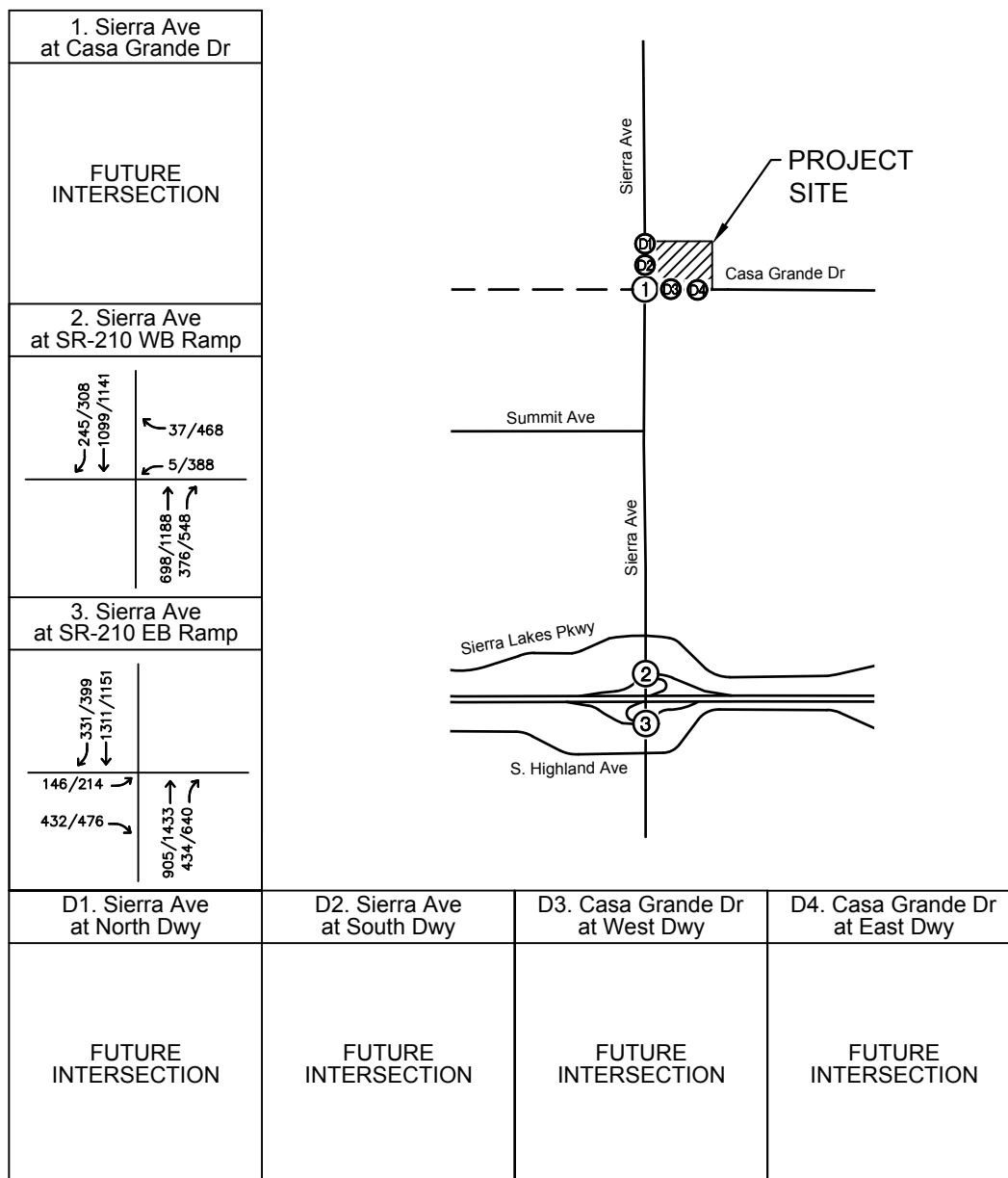


FIGURE 4
CITY OF FONTANA
HIERARCHY OF STREETS PLAN



NOT TO SCALE



LEGEND:

(X) = Study Intersection

XX/YY = AM/PM Peak Hour
Turning Movement
Volumes

**FIGURE 5
EXISTING TRAFFIC VOLUMES**

TABLE 1
SUMMARY OF INTERSECTION OPERATION
EXISTING CONDITIONS

Int. #	Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Sierra Avenue at Casa Grande Drive	Future Intersection				
2	Sierra Avenue at SR-210 WB Ramp	S	7.3	A	16.2	B
3	Sierra Avenue at SR-210 EB Ramp	S	13.3	B	14.3	B

Notes:

- Bold and shaded values indicate intersections operating at an unacceptable Level of Service, or a significant impact to the intersection, per City standards.
- At a signalized intersection, delay refers to the average control delay for the entire intersection, measured in seconds per vehicle.
- At an unsignalized intersection, delay refers to the average delay per vehicle on the intersection approach with the highest delay.
- Delay values are based on the methodology outlined in the Highway Capacity Manual (6th Edition).
- S = Signalized

PROJECT TRAFFIC

Project Trip Generation

Trip generation estimates for the project are based on daily and peak hourly trip generation rates obtained from the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition). ITE trip generation estimates for the project are based on the trip generation rate for the following ITE Land Use: Warehousing (Land Use 150).

Passenger vehicle and truck mix assumptions for the project were derived from the City of Fontana TIA Guidelines, which indicate that truck trips for a warehouse use make up approximately 20.43% of the project trips on a daily basis.

The Fontana study specifies a truck mix of approximately 17% of the trucks being 2-axle, 23% 3-axle, and 60% 4+-axle. These vehicle classification splits were applied to the daily and peak hour trip generation to develop an estimate of truck volumes by number of axles that would be associated with the proposed project.

Passenger car equivalent (PCE) factors were then applied to the truck types, based on number of axles (2.0 PCE for 2-axle trucks, 2.5 PCE for 3-axle trucks, and 3.0 PCE for 4+-axle trucks) to determine the total PCE volumes to be generated by the project.

The trip generation rates, truck mix, PCE factors, and the resulting trip generation estimates for the project are summarized on Table 2. With the PCE factors, the project is estimated to generate 782 PCE trips on a daily basis, with 77 PCE trips in the morning peak hour, and 85 PCE trips in the evening peak hour.

Trip Distribution and Assignment

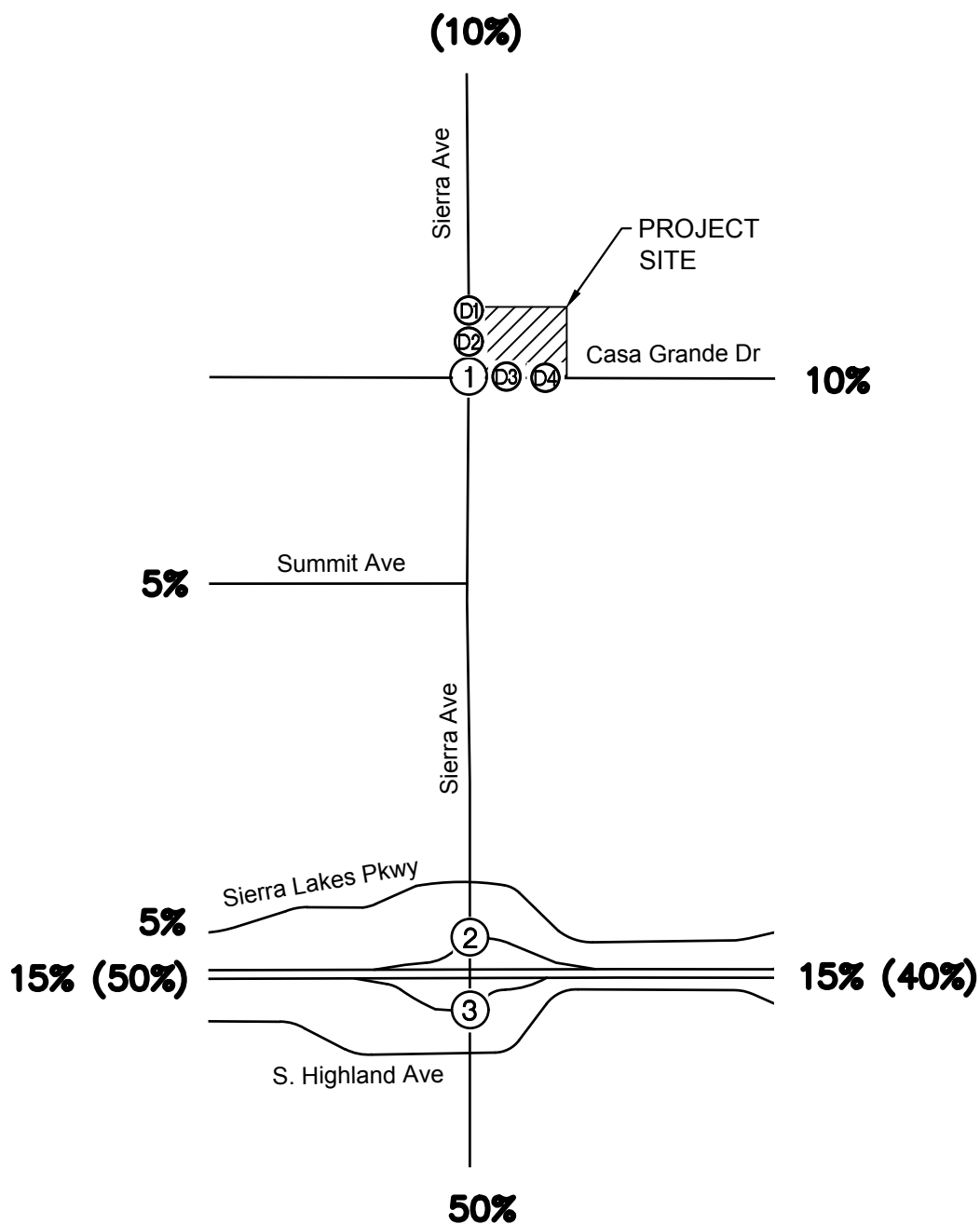
Project trip distribution assumptions for the project site were developed based on existing traffic patterns and the likely origins and destinations of employees and trucks. Trip distribution assumptions for passenger cars and trucks are shown on Figure 6. Based on the trip distribution and assignment assumptions, the new trips to be added to the street system by the proposed project were calculated and are shown on Figure 7.

TABLE 2
SUMMARY OF PROJECT TRIP GENERATION
SIERRA AND CASA GRANDE WAREHOUSE

TRIP GENERATION RATES										
ITE Land Use		ITE Code	Unit	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Warehousing		150	KSF	1,740	0.131	0.039	0.170	0.051	0.139	0.190
PROJECT TRIP GENERATION										
Project Land Use		Quantity	Unit	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Warehousing		332,996	KSF	579	44	13	57	17	46	63
Passenger Vehicles	79.57%			461	35	10	45	14	37	51
Trucks	20.43%			118	9	3	12	3	9	12
PROJECT TRIPS - PASSENGER CAR EQUIVALENTS (PCE)										
Vehicle Type	Vehicle Mix ¹	Daily Vehicles	PCE Factor	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Passenger Vehicles	79.57%	461	1.0	461	35	10	45	14	37	51
2-Axle Trucks	3.46%	20	2.0	40	3	1	4	1	3	4
3-Axle Trucks	4.64%	27	2.5	68	5	2	7	2	5	7
4+ Axle Trucks	12.33%	71	3.0	213	16	5	21	6	17	23
Total Truck PCE Trips				321	24	8	32	9	25	34
Total Project PCE Trips				782	59	18	77	23	62	85
Source: Institute of Transportation Engineers (ITE) <u>Trip Generation Manual</u>, 10th Edition PCE = Passenger Car Equivalent KSF = Thousand Square Feet ¹ Source: Truck Trip Generation Study - City of Fontana, August 2003										



NOT TO SCALE



LEGEND:

(X) = Study Intersection

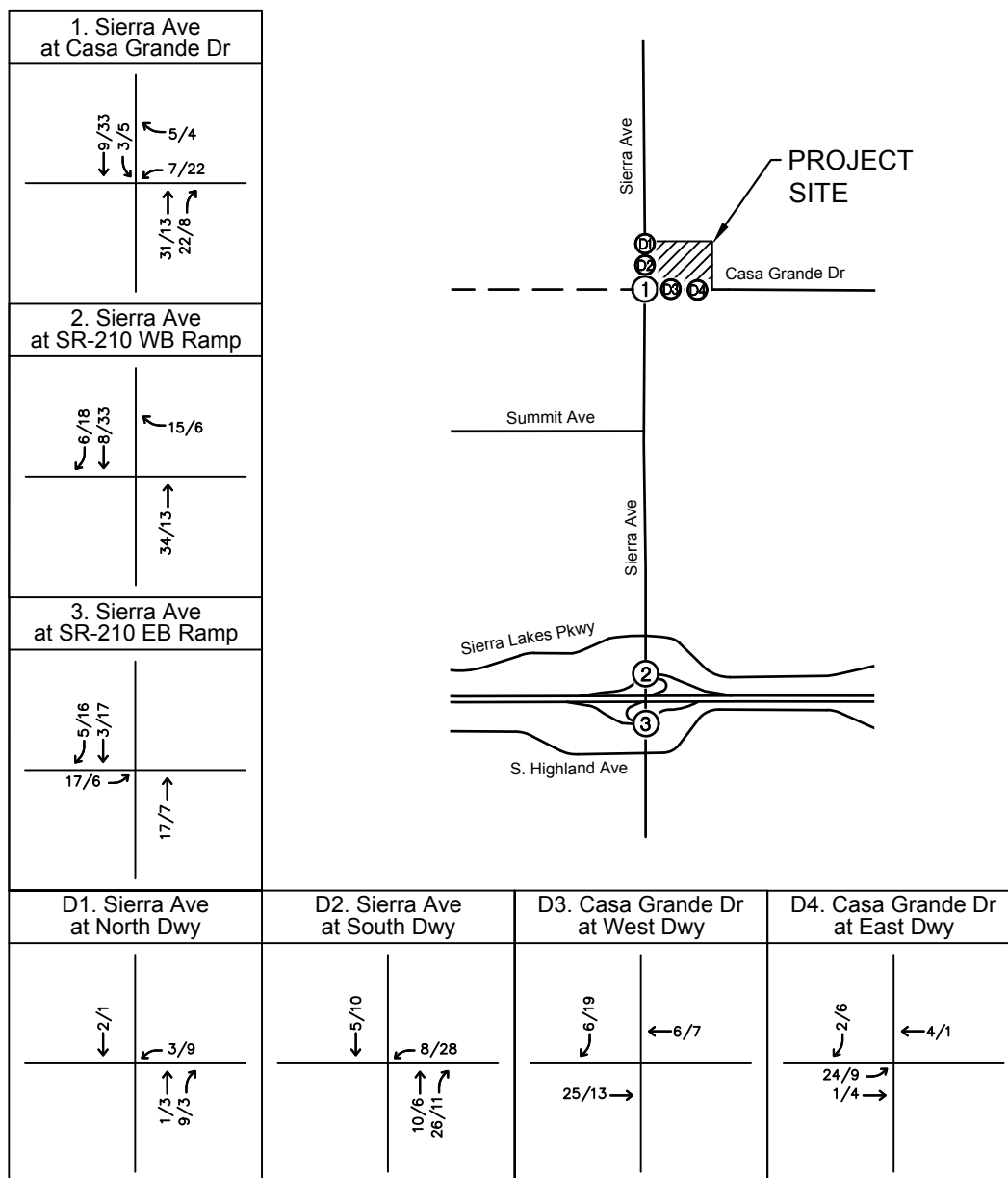
XX% = Passenger Car
Trip Distribution
Percentage

(YY%) = Truck Trip Distribution
Percentage

FIGURE 6
PROJECT TRIP DISTRIBUTION



NOT TO SCALE



* Project trips in Horizon Year scenarios re-route to accommodate right-in/right-out operations at D1 and D2.

LEGEND:

(X) = Study Intersection

XX/YY = AM/PM Peak Hour
Turning Movement
Volumes

**FIGURE 7
PROJECT-RELATED TRAFFIC VOLUMES**

Existing Plus Project Conditions

Project-related traffic was added to the Existing traffic volumes, and the resulting traffic volumes at the study locations are shown on Figure 8.

Peak Hour Operating Conditions

Intersection Level of Service analysis was conducted for the morning and evening peak hours for the Existing Plus Project condition. The results of the intersection analysis are shown on Table 3. Copies of intersection analysis worksheets for this scenario are provided in *Appendix C*.

Review of this table indicates that, with the addition of Project traffic, the following study intersection would operate at an unacceptable Level of Service during the peak hours:

- #1 - Sierra Avenue at Casa Grande Drive: AM – LOS E; PM – LOS E
- D1 – Sierra Avenue at North Driveway: AM – LOS D
- D2 – Sierra Avenue at South Driveway: AM – LOS D; PM – LOS D

The Level of Service for an unsignalized intersection is reported based on the single approach movement with the highest delay, which in this case, would be the westbound approach for intersections #1, D1, and D2. The side street traffic at the unsignalized intersections experience delay during the peak hours while waiting for an acceptable gap in traffic on Sierra Avenue. While the side street approach operates at a deficient Level of Service based on the highest delay approach, the overall intersection delay would be acceptable. Any queuing that occurs on the side street is contained on the minor intersection approach or driveways and does not impact the progression of traffic on the main arterial.

To improve the minor approach delay and access to the project driveways, it is recommended that the developer build half of the roadway width along the project frontage on Sierra Avenue, including two northbound lanes and a two-way left-turn lane (TWLTL). A median on Sierra Avenue along the project frontage is assumed in Horizon Year analyses.

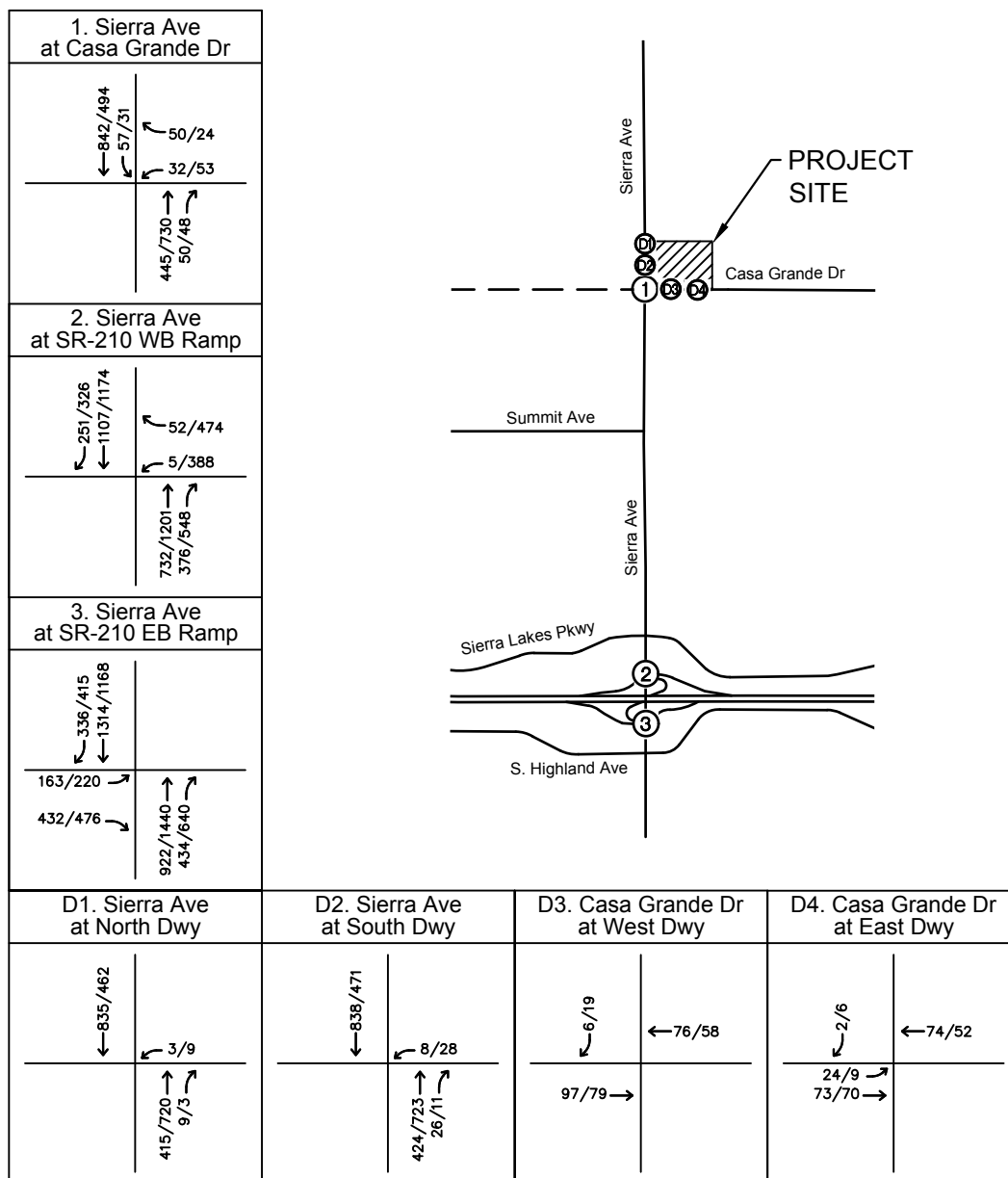
FUTURE CONDITIONS

Project Opening Year 2021 Conditions

The Project Opening Year (the year the project would be constructed and occupied) is anticipated to be Year 2021. Based on consultation with City staff, an ambient growth rate of 2% per year to Project Opening Year 2021 was applied to existing traffic volumes. Cumulative Project traffic was also added to Project Opening Year 2021 volumes and is explained below.



NOT TO SCALE



LEGEND:

(X) = Study Intersection

XX/YY = AM/PM Peak Hour
Turning Movement
Volumes

**FIGURE 8
EXISTING PLUS PROJECT
TRAFFIC VOLUMES**

TABLE 3
SUMMARY OF INTERSECTION OPERATION
EXISTING PLUS PROJECT

Int. #	Intersection	Traffic Control	AM Peak Hour						PM Peak Hour					
			Without Project		With Project		Project Impact	Impact Sig?	Without Project		With Project		Project Impact	Impact Sig?
			Delay	LOS	Delay	LOS			Delay	LOS	Delay	LOS		
1	Sierra Avenue at Casa Grande Drive	U	-	-	47.2	E	-	-	-	-	45.6	E	-	-
2	Sierra Avenue at SR-210 WB Ramp	S	7.3	A	7.5	A	0.2	No	16.2	B	16.3	B	0.1	No
3	Sierra Avenue at SR-210 EB Ramp	S	13.3	B	13.4	B	0.1	No	14.3	B	14.3	B	0.0	No
D1	Sierra Avenue at North Driveway	U			26.2	D	-	No			24.7	C	-	No
D2	Sierra Avenue at South Driveway	U			27.5	D	-	No			27.7	D	-	No
D3	Casa Grande Drive at West Driveway	U			8.7	A	-	No			8.7	A	-	No
D4	Casa Grande Drive at East Driveway	U			8.7	A	-	No			8.6	A	-	No

Notes:

- Bold and shaded values indicate intersections operating at an unacceptable Level of Service, or a significant impact to the intersection, per City standards.
- At a signalized intersection, delay refers to the average control delay for the entire intersection, measured in seconds per vehicle.
- At an unsignalized intersection, delay refers to the average delay per vehicle on the intersection approach with the highest delay.
- Delay values are based on the methodology outlined in the Highway Capacity Manual (6th Edition).
- S = Signalized; U = Unsignalized

Cumulative Projects

Information about Cumulative Projects in the area was provided by the City of Fontana. Cumulative Projects consist of any project that has been approved, but is not yet constructed/occupied, and projects that are in various stages of the application and approval process but have not yet been approved. A summary of Cumulative Projects in the project vicinity and the trip generation associated with each is provided on Table 4. The locations of the Cumulative Projects are shown on Figure 9.

Trip Generation

Trip generation information for Cumulative Projects was derived either from approved traffic studies, where available; or developed by Kimley-Horn if approved traffic studies were not available.

Trip Distribution and Assignment

Likewise, trip distribution and assignment for the Cumulative Projects were either derived from approved traffic studies, where available; or were developed by Kimley-Horn if approved traffic studies were not available. Project information and trip distribution assumptions for Cumulative Projects are provided in *Appendix D*.

Ambient growth and Cumulative Project trips were added to existing traffic to develop Project Opening Year 2021 forecasts. The resulting peak hour turning movement volumes at the study locations are shown in Figure 10.

Roadway and Intersection Improvements

Local roadway and intersection improvements have been conditioned on other projects or will be built before the completion of Cumulative Projects. For the Project Opening Year 2021 and Horizon Year 2040 analysis scenarios, the following local intersections improvements are assumed:

- Sierra Avenue and Casa Grande Drive
 - o Addition of west leg – one left-turn lane, one thru/ right-turn lane
 - o Installation of a traffic signal

Project Opening Year 2021 lane configurations and intersection control with the addition of these improvements are shown on Figure 11.

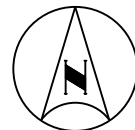
Peak Hour Operating Conditions

Intersection Level of Service analysis was conducted for the morning and evening peak hours for the Project Opening Year 2021 condition. The results are shown on Table 5. Intersection analysis worksheets for this scenario are provided in *Appendix C*.

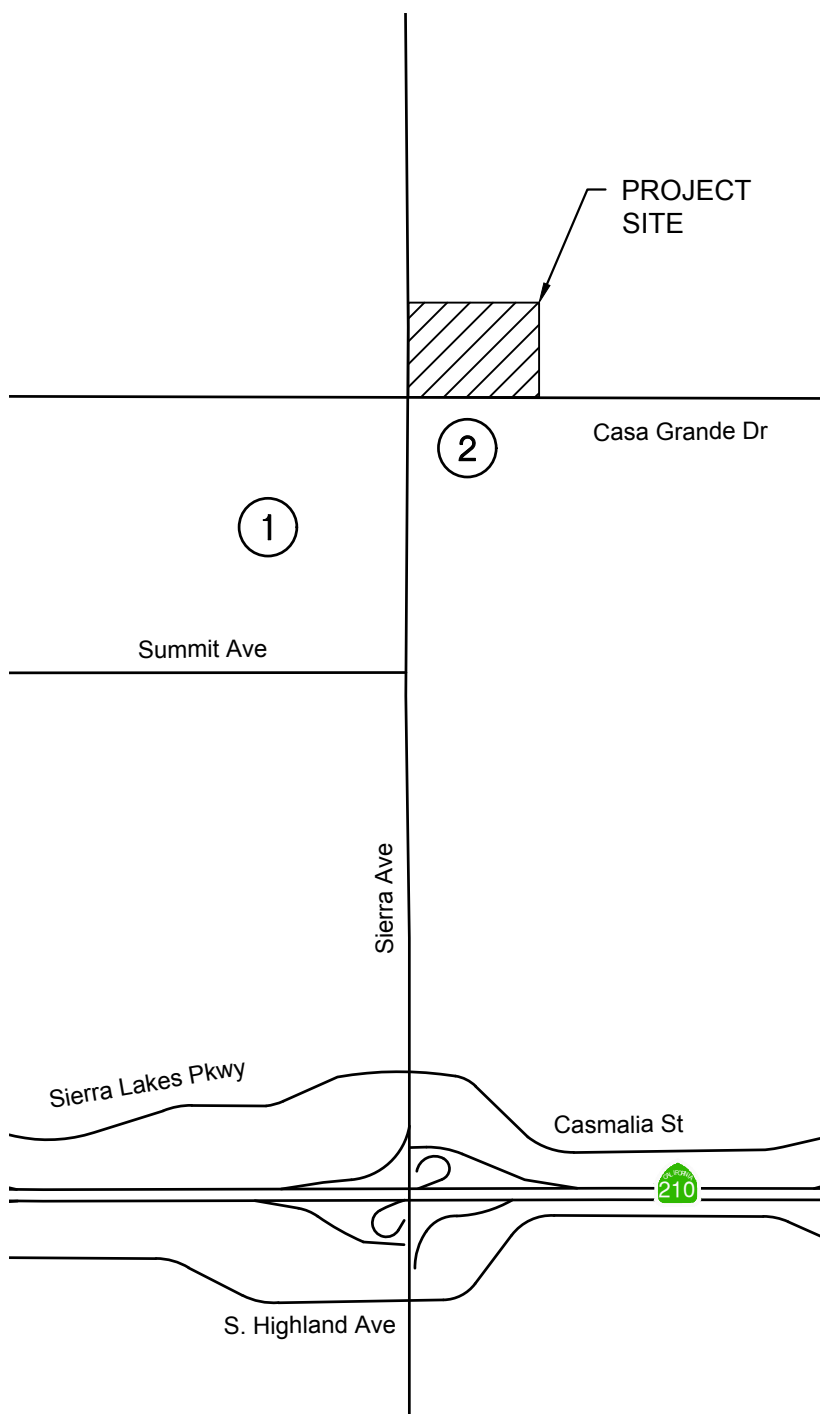
Review of this table indicates that, with the addition of background growth and cumulative project traffic, all study intersections would operate at an acceptable Level of Service.

**TABLE 4
SUMMARY OF CUMULATIVE PROJECTS**

Project #	Land Use	Quantity	Units	Trip Generation Estimates						
				Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
1	Summit at Rosena									
	Single-Family Detached Housing	856	DU	8,081	158	475	633	534	313	847
	Public Park	28	Acre	22	0	0	0	2	1	3
	Multipurpose Recreational Facility	44.000	KSF	*	*	*	*	87	71	158
	Elementary School	400	Student	756	145	123	268	33	35	68
2	SEC Sierra and Casa Grande - Warehouse	190.000	KSF	747	91	27	118	40	88	128
Total Project Trips				9,614	406	632	1,038	693	460	1,153
DU = Dwelling Units, KSF = 1,000 square feet										



NOT TO SCALE



LEGEND:

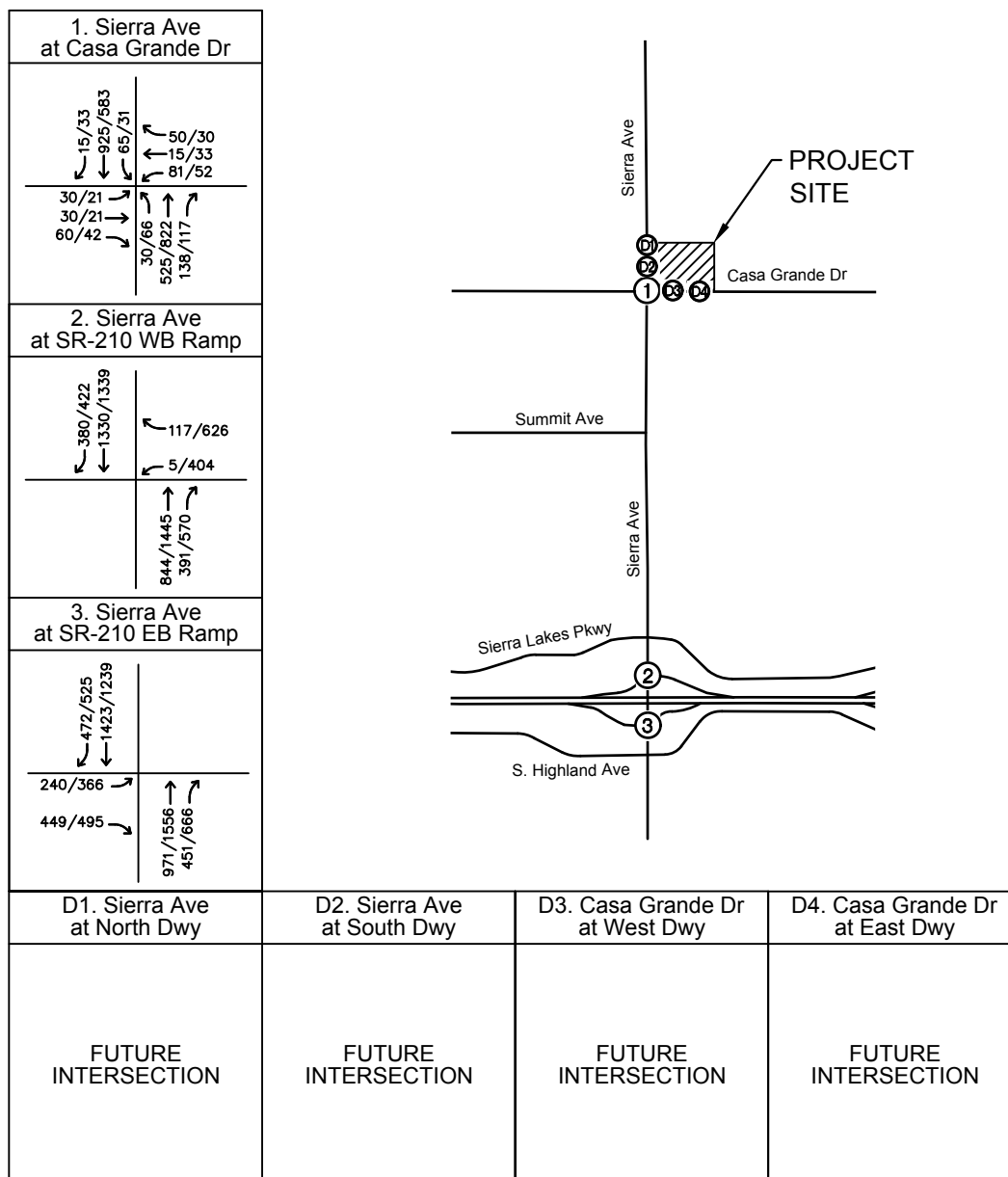


= Cumulative Project
See Appendix D

FIGURE 9
LOCATION OF CUMULATIVE PROJECTS



NOT TO SCALE



LEGEND:

(X) = Study Intersection

XX/YY = AM/PM Peak Hour
Turning Movement
Volumes

**FIGURE 10
PROJECT OPENING YEAR 2021
TRAFFIC VOLUMES**



NOT TO SCALE

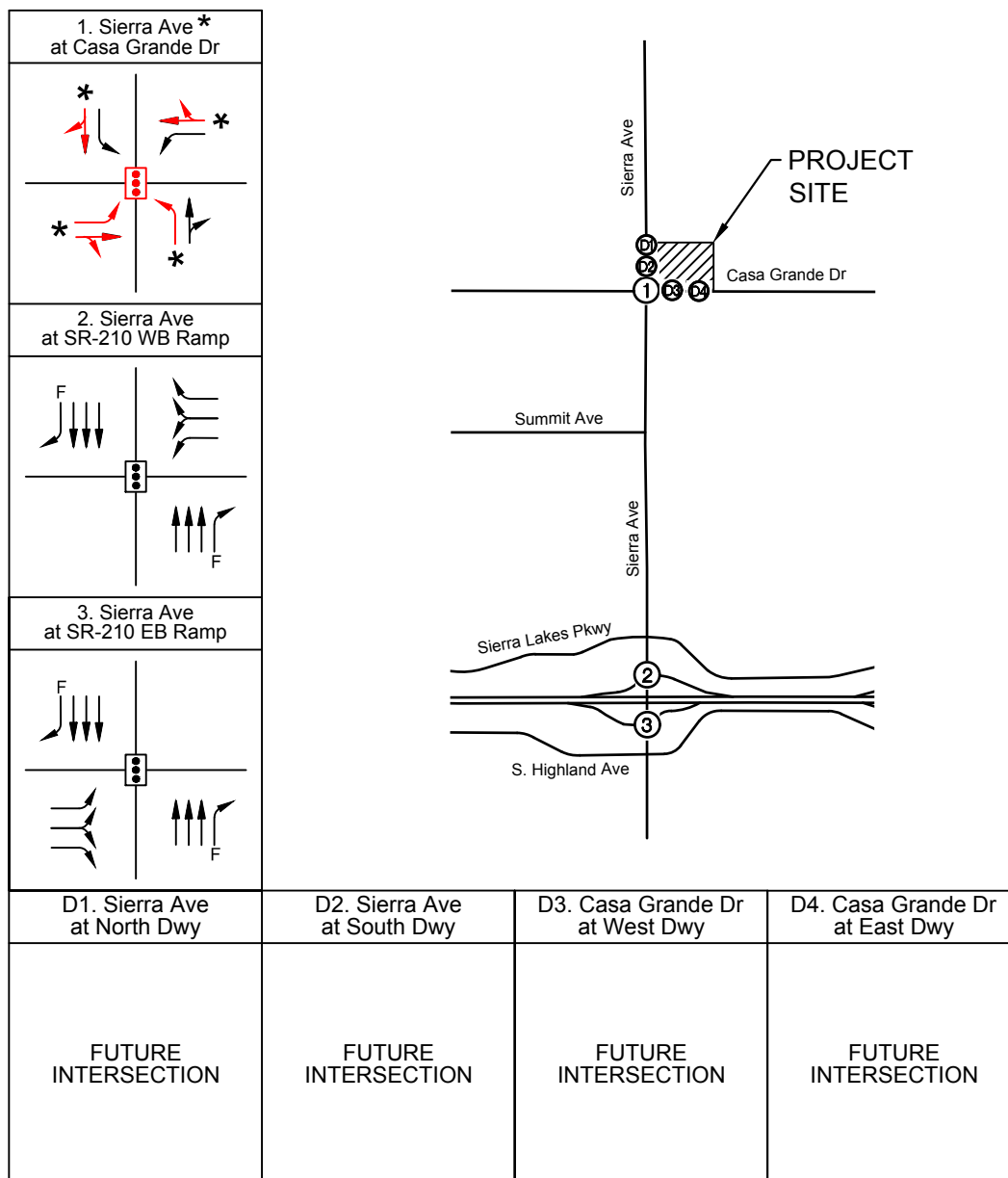


FIGURE 11
PROJECT OPENING YEAR 2021 LANE
CONFIGURATION AND TRAFFIC CONTROL

LEGEND:

- = Study Intersection
- = Turn or Through Lane
- = Signal
- = Free Right-Turn
- = Change in Geometry From Existing

TABLE 5
SUMMARY OF INTERSECTION OPERATION
PROJECT OPENING YEAR 2021

Int. #	Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Sierra Avenue at Casa Grande Drive	S	11.9	B	10.0	A
2	Sierra Avenue at SR-210 WB Ramp	S	8.4	A	17.5	B
3	Sierra Avenue at SR-210 EB Ramp	S	14.0	B	15.7	B

Notes:

- Bold and shaded values indicate intersections operating at an unacceptable Level of Service, or a significant impact to the intersection, per City standards.
- At a signalized intersection, delay refers to the average control delay for the entire intersection, measured in seconds per vehicle.
- At an unsignalized intersection, delay refers to the average delay per vehicle on the intersection approach with the highest delay.
- Delay values are based on the methodology outlined in the Highway Capacity Manual (6th Edition).
- S = Signalized; U = Unsignalized

FUTURE CONDITIONS WITH PROJECT

Project Opening Year 2021 Plus Project

Project-related traffic was added to the Project Opening Year 2021 traffic volumes, and the resulting peak hour turning movement volumes at the study intersections are shown on Figure 12.

Peak Hour Operating Conditions

Intersection Level of Service analysis was conducted for the morning and evening peak hours for the Project Opening Year 2021 Plus Project condition. The results of the intersection analysis are shown on Table 6. Copies of intersection analysis worksheets for this scenario are provided in *Appendix C*.

Review of this table indicates that, with the addition of Project traffic, all study intersections would operate at an acceptable Level of Service.

HORIZON YEAR CONDITIONS

Horizon Year 2040 Conditions

To develop the Horizon Year 2040 intersection turning movement forecasts, the San Bernardino Transportation Analysis Model (SBTAM) Base Year 2012 and Horizon Year 2040 future traffic projections were used. The raw forecasts obtained from the model output were post-processed by determining the annual growth between the base model year and the future model year and applying the resulting growth to existing count volumes. The B-Turns analysis worksheets, developed by the Federal Highway Administration (FHWA), translate the grown volumes into peak hour turning movements. As a conservative approach, if a turning movement volume produced by this model was less than Project Opening Year 2021 volumes for that movement, manual adjustments were made to assure that all forecast Horizon year volumes would be equal to or greater than the Project Opening Year 2021 turning movement volumes. Both SBTAM Model plots and B-Turns analysis worksheets are provided in *Appendix E*. The resulting traffic volumes for Horizon Year 2040 condition are shown on Figure 13.

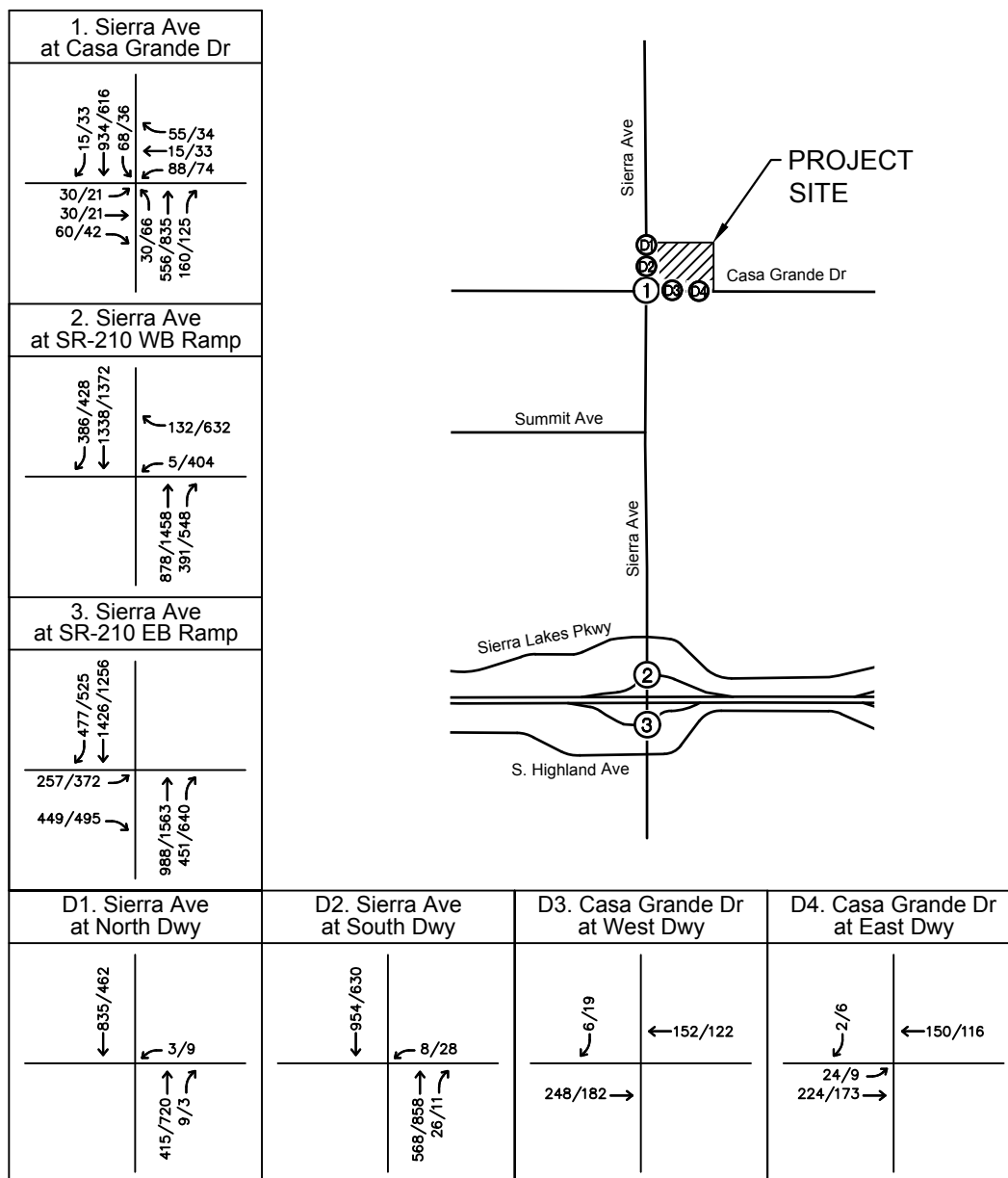
Peak Hour Operating Conditions

Intersection Level of Service analysis was conducted for the morning and evening peak hours for the Horizon Year 2040 condition. The results of the intersection analysis are shown on Table 7. Copies of intersection analysis worksheets for this scenario are provided in *Appendix C*.

Review of this table indicates that under Horizon Year 2040 conditions, the study intersections would operate at an acceptable Level of Service.



NOT TO SCALE



LEGEND:

(X) = Study Intersection

XX/YY = AM/PM Peak Hour
Turning Movement
Volumes

FIGURE 12
PROJECT OPENING YEAR 2021
PLUS PROJECT TRAFFIC VOLUMES

TABLE 6
SUMMARY OF INTERSECTION OPERATION
PROJECT OPENING YEAR 2021 PLUS PROJECT

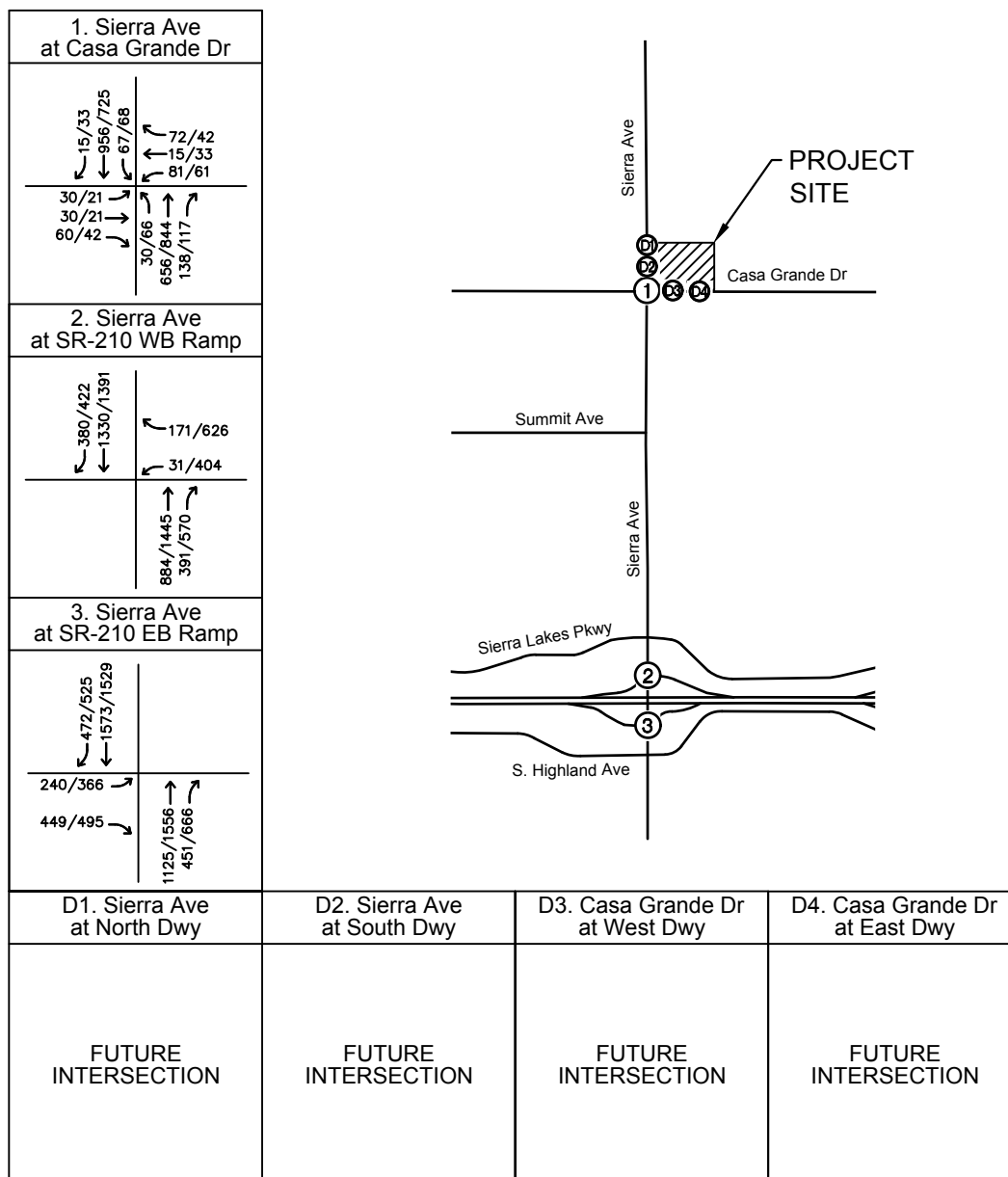
Int. #	Intersection	Traffic Control	AM Peak Hour						PM Peak Hour					
			Without Project		With Project		Project Impact	Impact Sig?	Without Project		With Project		Project Impact	Impact Sig?
			Delay	LOS	Delay	LOS			Delay	LOS	Delay	LOS		
1	Sierra Avenue at Casa Grande Drive	S	11.9	B	12.0	B	0.1	No	10.0	A	10.6	B	0.6	No
2	Sierra Avenue at SR-210 WB Ramp	S	8.4	A	8.5	A	0.1	No	17.5	B	17.6	B	0.1	No
3	Sierra Avenue at SR-210 EB Ramp	S	14.0	B	14.1	B	0.1	No	15.7	B	15.7	B	0.0	No
D1	Sierra Avenue at North Driveway	U			17.1	C	-	No			16.4	C	-	No
D2	Sierra Avenue at South Driveway	U			20.2	C	-	No			20.8	C	-	No
D3	Casa Grande Drive at West Driveway	U			9.1	A	-	No			9.0	A	-	No
D4	Casa Grande Drive at East Driveway	U			9.1	A	-	No			8.9	A	-	No

Notes:

- Bold and shaded values indicate intersections operating at an unacceptable Level of Service, or a significant impact to the intersection, per City standards.
- At a signalized intersection, delay refers to the average control delay for the entire intersection, measured in seconds per vehicle.
- At an unsignalized intersection, delay refers to the average delay per vehicle on the intersection approach with the highest delay.
- Delay values are based on the methodology outlined in the Highway Capacity Manual (6th Edition).
- S = Signalized; U = Unsignalized



NOT TO SCALE



LEGEND:

(X) = Study Intersection

XX/YY = AM/PM Peak Hour
Turning Movement
Volumes

**FIGURE 13
HORIZON YEAR 2040
TRAFFIC VOLUMES**

TABLE 7
SUMMARY OF INTERSECTION OPERATION
HORIZON YEAR 2040

Int. #	Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Sierra Avenue at Casa Grande Drive	S	12.1	B	10.5	B
2	Sierra Avenue at SR-210 WB Ramp	S	9.0	A	17.6	B
3	Sierra Avenue at SR-210 EB Ramp	S	13.6	B	15.8	B

Notes:

- Bold and shaded values indicate intersections operating at an unacceptable Level of Service, or a significant impact to the intersection, per City standards.
- At a signalized intersection, delay refers to the average control delay for the entire intersection, measured in seconds per vehicle.
- At an unsignalized intersection, delay refers to the average delay per vehicle on the intersection approach with the highest delay.
- Delay values are based on the methodology outlined in the Highway Capacity Manual (6th Edition).
- S = Signalized; U = Unsignalized

Horizon Year 2040 Plus Project Conditions

Project-related traffic was added to the Horizon Year 2040 traffic volumes. Horizon Year 2040 Plus Project peak hour turning movement volumes at study intersections are shown on Figure 14.

Peak Hour Operating Conditions

Intersection Level of Service analysis was conducted for the morning and evening peak hours for the Horizon Year 2040 Plus Project condition. The results of the intersection analysis are shown on Table 8. Copies of intersection analysis worksheets for this scenario are provided in *Appendix C*.

Review of this table indicates that, with the addition of Project traffic, the study intersections would operate at an acceptable Level of Service.

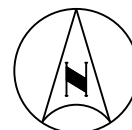
MITIGATION MEASURES

Based on the Level of Service standards and significant impact criteria discussed previously, the project-related impact would not be considered significant at any of the study intersections; therefore, no mitigation is required.

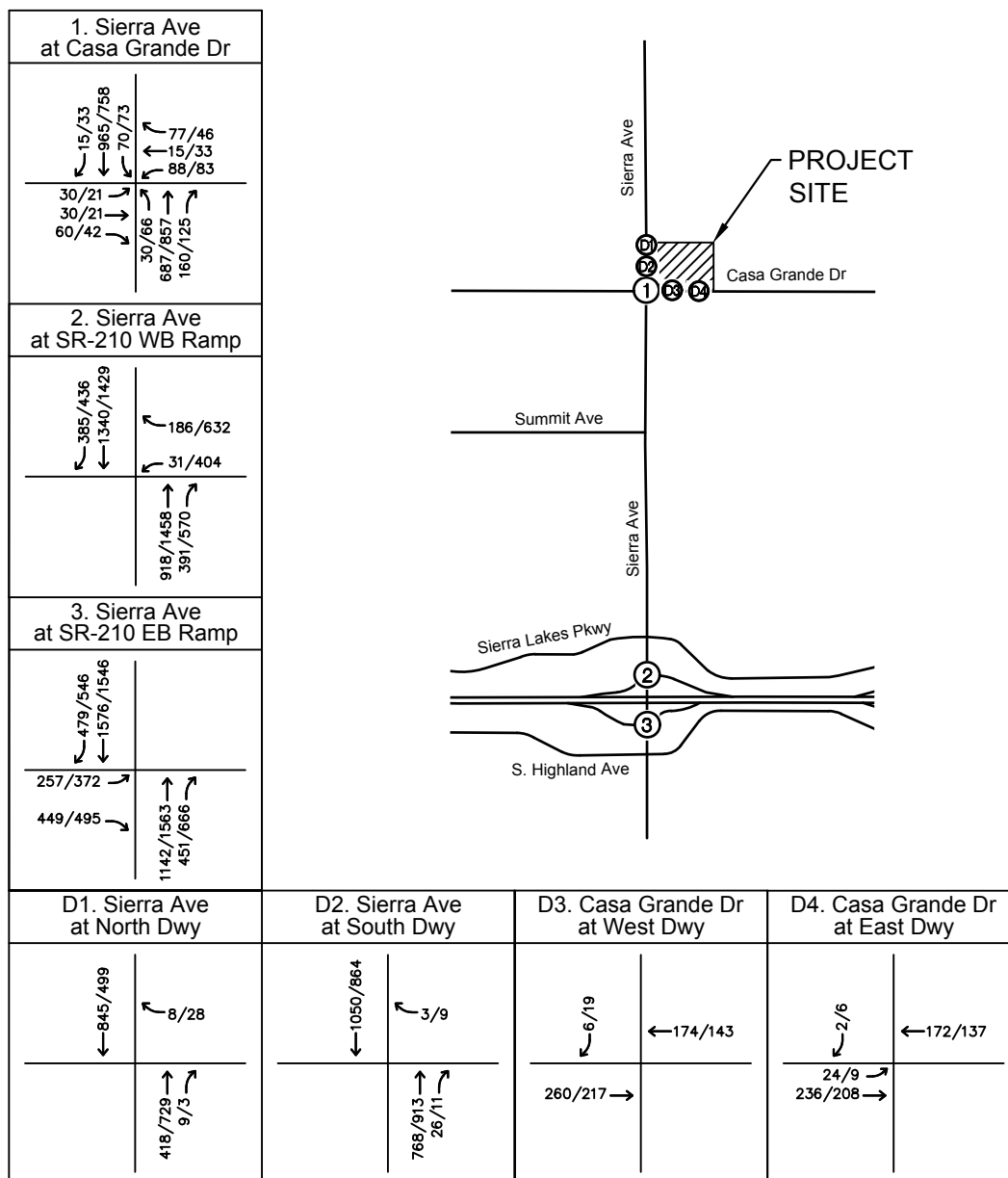
SITE CIRCULATION

Vehicular access for the project site would be via two full-movement driveways on Sierra Avenue, one western right-in/right-out driveway on Casa Grande Drive, and one full-movement driveway to the east. All project driveways would be unsignalized. In Horizon Year conditions, both driveways on Sierra Avenue are to only allow right-in/right-out movements due to the installation of a raised median.

The project site plan presented on Figure 2 (previously referenced) indicates that passenger vehicles would access the project site via the two driveways on the Sierra Avenue and trucks would access the project site via the two driveways on Casa Grande Drive. Because the west driveway on Casa Grande Drive only allows right-in/right-out movements, it is recommended that trucks enter the project site via the full-movement east driveway to reduce the potential for trucks spilling back into the intersection of Sierra Avenue at Casa Grande Drive.



NOT TO SCALE



LEGEND:

(X) = Study Intersection

XX/YY = AM/PM Peak Hour
Turning Movement
Volumes

FIGURE 14
HORIZON YEAR 2040
PLUS PROJECT TRAFFIC VOLUMES

TABLE 8
SUMMARY OF INTERSECTION OPERATION
HORIZON YEAR 2040 PLUS PROJECT

Int. #	Intersection	Traffic Control	AM Peak Hour						PM Peak Hour					
			Without Project		With Project		Project Impact	Impact Sig?	Without Project		With Project		Project Impact	Impact Sig?
			Delay	LOS	Delay	LOS			Delay	LOS	Delay	LOS		
1	Sierra Avenue at Casa Grande Drive	S	12.1	B	12.7	B	0.6	No	10.5	B	11.4	B	0.9	No
2	Sierra Avenue at SR-210 WB Ramp	S	9.0	A	9.2	A	0.2	No	17.6	B	17.7	B	0.1	No
3	Sierra Avenue at SR-210 EB Ramp	S	13.6	B	13.8	B	0.2	No	15.8	B	15.9	B	0.1	No
D1 ¹	Sierra Avenue at North Driveway	U			10.9	B	-	No			14.7	B	-	No
D2 ¹	Sierra Avenue at South Driveway	U			14.7	B	-	No			17.0	C	-	No
D3	Casa Grande Drive at West Driveway	U			9.2	A	-	No			9.1	A	-	No
D4	Casa Grande Drive at East Driveway	U			9.2	A	-	No			9.0	A	-	No

Notes:

¹Right-in/right-out operation at Sierra Ave Driveways under Horizon Year conditions

- Bold and shaded values indicate intersections operating at an unacceptable Level of Service, or a significant impact to the intersection, per City standards.
- At a signalized intersection, delay refers to the average control delay for the entire intersection, measured in seconds per vehicle.
- At an unsignalized intersection, delay refers to the average delay per vehicle on the intersection approach with the highest delay.
- Delay values are based on the methodology outlined in the Highway Capacity Manual (6th Edition).
- S = Signalized; U = Unsignalized

SUMMARY OF FINDINGS AND CONCLUSIONS

- The project is located on the northeast corner of the future intersection of Sierra Avenue and Casa Grande Drive, in the northern area of the City of Fontana.
- The project consists of the construction of a 332,996 square-foot warehouse with 134 parking stalls, including 67 trailer parking stalls as well as 35 loading docks.
- The project is estimated to generate 782 trips on a daily basis, with 77 trips in the morning peak hour, and 85 trips in the evening peak hour.
- Based on the City of Fontana's Level of Service standards and significant impact criteria, the project-related impact would not be considered significant at the study intersections; therefore, no mitigation is required.
- Vehicular access for the project site would be via two full-movement driveways on Sierra Avenue and two full-movement driveways on Casa Grande Drive. All project driveways would be unsignalized. Horizon Years allow only right-in/right-out driveways on Sierra Avenue.
- Passenger vehicles would access the project site via the two driveways on the Sierra Avenue. Trucks would access the project site via the two driveways on Casa Grande Drive.
- To improve the minor approach delay and access at the project driveways, it is recommended that the developer build half of the roadway width along the project frontage on Sierra Avenue which would include two northbound lanes and a two-way left-turn lane (TWLTL) .
- It is recommended that trucks enter the project site via the full-movement east driveway on Casa Grande Drive to reduce the potential for trucks spilling back into the intersection of Sierra Avenue at Casa Grande Drive. The west driveway on Casa Grande allows only right-in/right-out movements.

APPENDIX A
APPROVED SCOPING AGREEMENT

Exhibit B

SCOPING AGREEMENT FOR TRAFFIC IMPACT STUDY

This letter acknowledges the City of Fontana Engineering Department requirements for traffic impact analysis of the following project. The analysis must follow the SANBAG Traffic Study Guidelines Updated 2016.

Case No. (i.e. TR, PM, CUP, PP)

Related Cases -

SP No. _____

EIR No. _____

GPA No. _____

CZ No. _____

Project Name: Sierra and Casa Grande Warehouse

Project Address: Northeast corner of Sierra Avenue and Casa Grande Drive

Project Description: 317,820-square-foot Warehouse

Consultant

Name: Kimley-Horn and Associates, Inc.

Address: 765 The City Drive, Suite 200

Orange, CA 92868

Telephone: 714-939-1030

Fax: _____

Developer

RGA, Office of Architectural Design, Inc.

15231 Alton Parkway, Suite 100

Irvine, CA 92618

949-341-0920

A. Trip Generation Source: ITE Trip Generation Manual - 10th Edition - See attached Table -

Current GP Land Use

Regional Mixed Use

Proposed Land Use

Industrial Warehouse

Current Zoning

Regional Mixed Use (R-MU)

Proposed Zoning

Regional Mixed Use with Overlay (R-MU Overlay)

Current Trip Generation

	In	Out	Total
AM Trips	<u>0</u>	<u>0</u>	<u>0</u>
PM Trips	<u>0</u>	<u>0</u>	<u>0</u>

Proposed Trip Generation

	In	Out	Total
AM Trips	<u>55</u>	<u>16</u>	<u>71</u>
PM Trips	<u>21</u>	<u>57</u>	<u>78</u>

Internal Trip Allowance

☐

Yes

☒

No

Pass-By Trip Allowance

☐

Yes

☒

No

(0 % Trip Discount)

(0 % Trip Discount)

A passby trip discount of 25% is allowed for appropriate land uses. The passby trips at adjacent study area intersections and project driveways shall be indicated on a report figure.

B. Trip Geographic Distribution: N Trucks - 10% S Trucks - 90%* E Trucks - 0% W Trucks - 0%
(attach exhibit for detailed assignment) Cars - 0% Cars - 90% Cars - 0% Cars - 10%

* Trucks will travel south on Sierra Avenue to connect to the SR-210 freeway

C. Background Traffic

Project Build-out Year: 2021

Annual Ambient Growth Rate: 2.0 %

Phase Year(s) N/A

Other area projects to be analyzed: Information regarding Related Projects will be requested from the Planning Department

Model/Forecast methodology

Opening Year 2021: Existing + Growth + Cumulative Projects + Project / Forecast 2040: SBTAM Forecasts

Exhibit B – Scoping Agreement – Page 2

D. Study intersections: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)

- | | |
|---|-----------|
| 1. <u>Sierra Avenue at Casa Grande Drive</u> | 6. _____ |
| 2. <u>Sierra Avenue at SR-210 Westbound Ramps</u> | 7. _____ |
| 3. <u>Sierra Avenue at SR-210 Eastbound Ramps</u> | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

E. Study Roadway Segments: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

E. Other Jurisdictional Impacts

Is this project within a City's Sphere of Influence or one-mile radius of City boundaries? ☒ Yes ☐ No

If so, name of City Jurisdiction: Rialto

F. Site Plan (please attach reduced copy)

G. Specific issues to be addressed in the Study (in addition to the standard analysis described in the Guideline) (To be filled out by Engineering Department)

(NOTE: If the traffic study states that "a traffic signal is warranted" (or "a traffic signal appears to be warranted," or similar statement) at an existing unsignalized intersection under existing conditions, 8-hour approach traffic volume information must be submitted in addition to the peak hourly turning movement counts for that intersection.)

H. Existing Conditions

Traffic count data must be new or recent. Provide traffic count dates if using other than new counts.
Date of counts _____

Recommended by:

Trevor Briggs 587/2019
Consultant's Representative Date

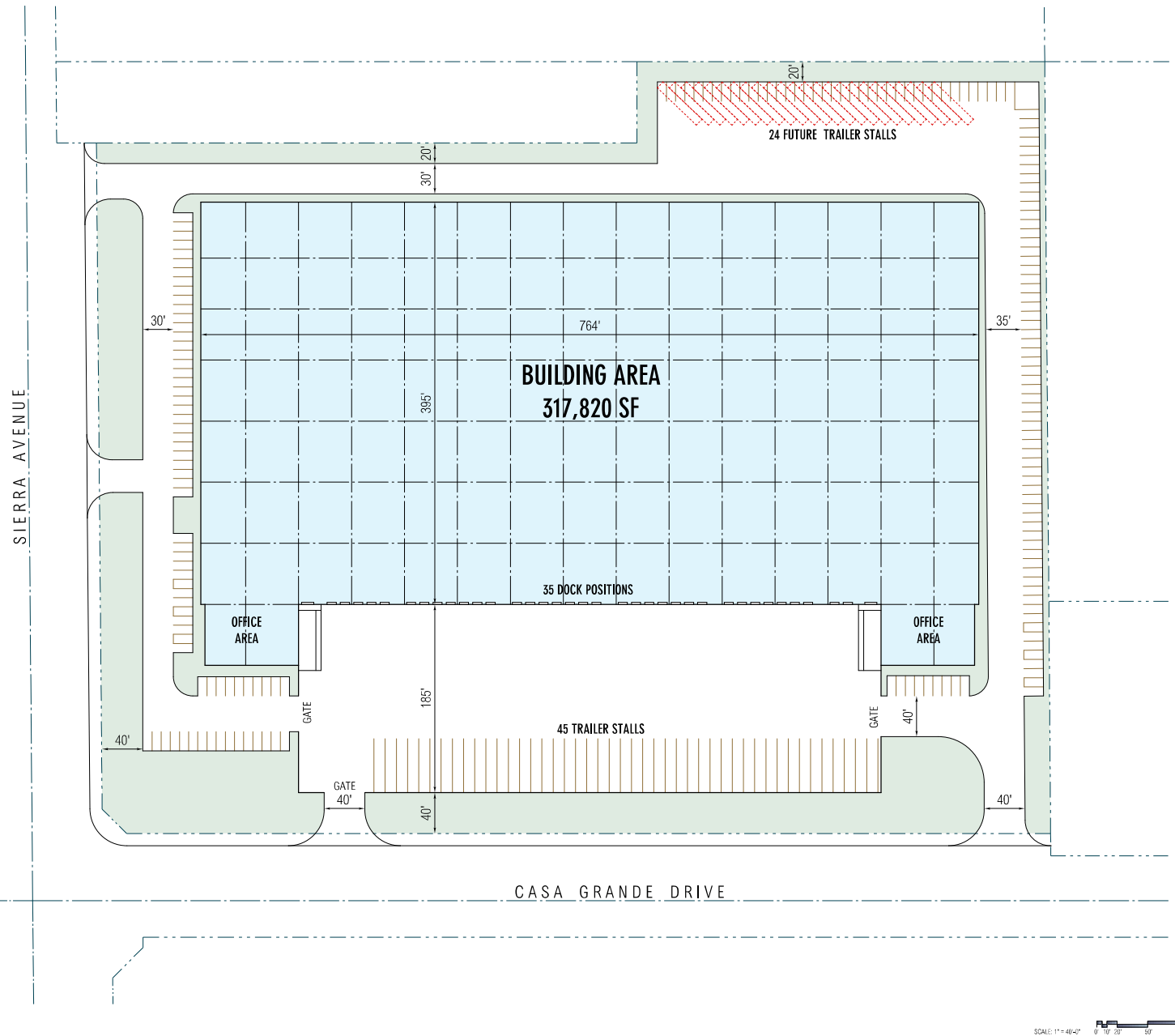
Approved Scoping Agreement:

City of Fontana Project Engineer Date

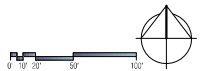
Scoping Agreement Submitted on _____

Revised on _____

TRAILER PARKING: 45 TRAILERS



SCALE: 1" = 40'-0"

[illegible]

RGA PROJECT NO:	18044-00
CAD FILE NAME:	18044-00-A1-02
DRAWN BY:	MG
CHECKED BY:	CS
COPYRIGHT: RGA, OFFICE OF ARCHITECTURAL DESIGN, INC.	
SHEET TITLE	

A1-02

ATTACHMENT 2
PROJECT STUDY AREA AND TRIP DISTRIBUTION



ATTACHMENT 2

PROJECT STUDY AREA AND TRIP DISTRIBUTION

STUDY INTERSECTION

1. Sierra Avenue at Casa Grande Drive
2. Sierra Avenue at SR-210 Westbound Ramps
3. Sierra Avenue at SR-210 Eastbound Ramps

ATTACHMENT 3
SUMMARY OF PROJECT TRIP GENERATION
FONTANA - SIERRA AND CASA GRANDE WAREHOUSE

TRIP GENERATION RATES

ITE Land Use	ITE Code	Unit	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Warehousing	150	KSF	1.740	0.131	0.039	0.170	0.051	0.139	0.190

PROJECT TRIP GENERATION

Project Land Use		Quantity	Unit	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Warehousing		317.820	KSF	553	42	12	54	16	44	60
Passenger Vehicles	79.57%			440	33	10	43	13	35	48
Trucks	20.43%			113	9	2	11	3	9	12

PROJECT TRIPS - PASSENGER CAR EQUIVALENTS (PCE)

Vehicle Type	Vehicle Mix ¹	Daily Vehicles	PCE Factor	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Passenger Vehicles	79.57%	440	1.0	440	33	10	43	13	35	48
2-Axle Trucks	3.46%	19	1.5	29	2	1	3	1	2	3
3-Axle Trucks	4.64%	26	2.0	52	4	1	5	1	4	5
4+ Axle Trucks	12.33%	68	3.0	204	16	4	20	6	16	22
Total Truck PCE Trips				285	22	6	28	8	22	30
Total Project PCE Trips				725	55	16	71	21	57	78

Source: Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition

PCE = Passenger Car Equivalent

KSF = Thousand Square Feet

¹ Source: Truck Trip Generation Study - City of Fontana, August 2003

APPENDIX B
TRAFFIC COUNT DATA SHEETS

CLASSIFICATION

Sierra Ave N/O The LGE Electronics Warehouse

Day: Tuesday

City: Fontana

Date: 9/10/2019

Project #: CA19_6114_001n

North Bound

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	46	10	0	1	0	0	0	0	0	0	0	0	57
01:00	0	33	11	0	1	0	0	0	0	0	0	0	0	45
02:00	0	33	11	0	3	0	0	0	0	0	0	0	0	47
03:00	0	38	15	0	4	1	0	1	0	0	0	0	0	59
04:00	0	40	24	0	5	0	0	0	1	0	0	0	0	70
05:00	0	117	37	1	3	0	0	1	1	0	0	0	0	160
06:00	0	95	39	1	8	0	0	3	1	0	0	0	0	147
07:00	6	271	54	2	7	0	3	2	4	0	5	0	0	354
08:00	3	208	34	1	5	3	1	0	9	0	3	0	0	267
09:00	1	184	40	3	6	1	2	0	3	0	1	0	0	241
10:00	0	244	54	0	6	1	3	2	2	0	1	0	0	313
11:00	2	263	69	0	5	3	1	1	1	0	4	0	0	349
12:00 PM	1	307	83	0	9	2	1	2	1	0	2	0	0	408
13:00	1	390	64	2	13	2	1	1	2	0	2	0	0	478
14:00	1	413	73	1	9	0	0	1	1	0	2	0	0	501
15:00	0	475	107	3	9	1	1	2	4	0	1	0	0	603
16:00	1	498	125	1	12	1	0	1	1	0	0	0	0	640
17:00	2	539	107	1	5	0	0	0	2	0	0	0	0	656
18:00	1	389	82	0	12	0	0	4	0	0	0	0	0	488
19:00	1	384	53	2	4	0	0	1	0	0	0	0	0	445
20:00	1	313	62	0	3	0	0	0	0	0	0	0	0	379
21:00	0	243	29	0	5	0	0	0	0	0	0	0	0	277
22:00	0	135	22	0	2	1	0	1	0	0	0	0	0	161
23:00	0	79	15	0	1	0	0	1	0	0	0	0	0	96
Totals	21	5737	1220	18	138	16	13	24	33		21			7241
% of Totals	0%	79%	17%	0%	2%	0%	0%	0%	0%		0%			100%

AM Volumes	12	1572	398	8	54	9	10	10	22	0	14	0	0	2109
% AM	0%	22%	5%	0%	1%	0%	0%	0%	0%		0%			29%
AM Peak Hour	07:00	07:00	11:00	09:00	06:00	08:00	07:00	06:00	08:00		07:00			07:00
Volume	6	271	69	3	8	3	3	3	9		5			354
PM Volumes	9	4165	822	10	84	7	3	14	11	0	7	0	0	5132
% PM	0%	58%	11%	0%	1%	0%	0%	0%	0%		0%			71%
PM Peak Hour	17:00	17:00	16:00	15:00	13:00	12:00	12:00	18:00	15:00		12:00			17:00
Volume	2	539	125	3	13	2	1	4	4		2			656
Directional Peak Periods		AM 7-9				NOON 12-2				PM 4-6		Off Peak Volumes		
All Classes		Volume		%		Volume		%		Volume		Volume		%
		621	↔	9%		886	↔	12%		1296	↔	4438	↔	61%

Classification Definitions

1 Motorcycles	4 Buses	7 >=4-Axle Single Units	10 >=6-Axle Single Trailers	13 >=7-Axle Multi-Trailers
2 Passenger Cars	5 2-Axle, 6-Tire Single Units	8 <=4-Axle Single Trailers	11 <=5-Axle Multi-Trailers	
3 2-Axle, 4-Tire Single Units	6 3-Axle Single Units	9 5-Axle Single Trailers	12 6-Axle Multi-Trailers	

CLASSIFICATION

Sierra Ave N/O The LGE Electronics Warehouse

Day: Tuesday
Date: 9/10/2019

City: Fontana
Project #: CA19_6114_001s

South Bound

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	34	5	0	1	0	0	1	0	0	0	0	0	41
01:00	0	21	1	0	1	0	0	0	0	0	0	0	0	23
02:00	0	16	8	0	3	0	0	1	0	0	0	0	0	28
03:00	0	47	8	0	1	0	0	0	0	0	0	0	0	56
04:00	0	95	25	0	0	0	0	1	0	0	0	0	0	121
05:00	0	158	58	0	6	0	0	1	0	0	0	0	0	223
06:00	0	388	74	0	13	0	0	6	0	0	0	0	0	481
07:00	0	666	93	0	10	3	0	1	1	0	0	0	0	774
08:00	0	509	91	2	13	5	0	1	5	0	1	0	0	627
09:00	2	344	78	1	8	0	2	1	1	0	1	0	0	438
10:00	1	351	66	4	12	4	1	1	1	0	1	0	0	442
11:00	2	308	68	0	10	3	0	1	4	0	3	0	0	399
12:00 PM	0	307	66	0	8	0	0	1	3	0	2	0	0	387
13:00	4	326	64	2	8	2	0	0	6	0	2	0	0	414
14:00	1	397	93	1	8	2	0	3	2	0	0	0	0	507
15:00	0	395	67	3	9	0	0	2	3	0	0	0	0	479
16:00	2	335	69	2	9	0	0	3	0	0	0	0	0	420
17:00	1	325	76	1	11	0	0	1	0	0	0	0	0	415
18:00	1	309	50	0	4	0	0	2	0	0	0	0	0	366
19:00	0	191	35	1	3	0	0	3	1	0	0	0	0	234
20:00	0	168	22	0	4	1	0	1	0	0	0	0	0	196
21:00	0	108	10	0	3	0	0	0	0	0	0	0	0	121
22:00	0	88	12	0	1	0	0	2	0	0	0	0	0	103
23:00	0	63	8	0	1	0	0	0	0	0	0	0	0	72
Totals	14	5949	1147	17	147	20	3	33	27		10			7367
% of Totals	0%	81%	16%	0%	2%	0%	0%	0%	0%		0%			100%

AM Volumes	5	2937	575	7	78	15	3	15	12	0	6	0	0	3653
% AM	0%	40%	8%	0%	1%	0%	0%	0%	0%		0%			50%
AM Peak Hour	09:00	07:00	07:00	10:00	06:00	08:00	09:00	06:00	08:00		11:00			07:00
Volume	2	666	93	4	13	5	2	6	5		3			774
PM Volumes	9	3012	572	10	69	5	0	18	15	0	4	0	0	3714
% PM	0%	41%	8%	0%	1%	0%		0%	0%		0%			50%
PM Peak Hour	13:00	14:00	14:00	15:00	17:00	13:00		14:00	13:00		12:00			14:00
Volume	4	397	93	3	11	2		3	6		2			507
Directional Peak Periods			AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Classes			Volume	%		Volume	%		Volume	%		Volume	%	
			1401	↔	19%	801	↔	11%	835	↔	11%	4330	↔	59%

Classification Definitions

1 Motorcycles	4 Buses	7 >=4-Axle Single Units	10 >=6-Axle Single Trailers	13 >=7-Axle Multi-Trailers
2 Passenger Cars	5 2-Axle, 6-Tire Single Units	8 <=4-Axle Single Trailers	11 <=5-Axle Multi-Trailers	
3 2-Axle, 4-Tire Single Units	6 3-Axle Single Units	9 5-Axle Single Trailers	12 6-Axle Multi-Trailers	

CLASSIFICATION

Casa Grande Dr Bet. Palmetto Ave & Tamarind Ave

Day: Tuesday

City: Fontana

Date: 9/10/2019

Project #: CA19_6114_002e

East Bound

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	7	1	0	0	0	0	0	0	0	0	0	0	8
01:00	0	16	1	0	0	0	0	0	0	0	0	0	0	17
02:00	0	22	2	0	0	0	0	0	0	0	0	0	0	24
03:00	0	78	12	0	0	0	0	0	0	0	0	0	0	90
04:00	0	18	3	0	0	0	0	0	0	0	0	0	0	21
05:00	0	34	2	0	0	0	0	0	0	0	0	0	0	36
06:00	0	27	6	0	0	1	0	0	1	0	0	0	0	35
07:00	0	65	8	1	2	0	0	0	0	0	0	0	0	76
08:00	0	35	9	0	0	1	0	0	0	0	0	0	0	45
09:00	0	21	3	0	1	1	0	0	1	0	0	0	0	27
10:00	0	41	5	1	0	2	0	0	2	0	0	0	0	51
11:00	0	35	5	0	1	1	0	0	0	0	0	0	0	42
12:00 PM	0	49	5	0	1	0	0	0	0	0	0	0	0	55
13:00	0	40	4	0	1	0	0	0	0	0	0	0	0	45
14:00	0	65	10	0	0	0	0	0	0	0	0	0	0	75
15:00	0	55	10	0	0	0	0	0	0	0	0	0	0	65
16:00	0	153	29	0	1	0	0	0	0	0	0	0	0	183
17:00	0	49	11	0	0	0	0	0	0	0	0	0	0	60
18:00	0	50	7	0	1	0	0	0	0	0	0	0	0	58
19:00	0	55	6	0	0	0	0	0	0	0	0	0	0	61
20:00	0	24	2	0	0	0	0	0	0	0	0	0	0	26
21:00	0	45	9	0	0	0	0	0	1	0	0	0	0	55
22:00	0	20	6	0	0	0	0	0	0	0	0	0	0	26
23:00	0	11	2	0	1	0	0	0	0	0	0	0	0	14
Totals		1015	158	2	9	6			5					1195
% of Totals		85%	13%	0%	1%	1%			0%					100%

AM Volumes	0	399	57	2	4	6	0	0	4	0	0	0	0	472			
% AM		33%	5%	0%	0%	1%			0%					39%			
AM Peak Hour		03:00	03:00	07:00	07:00	10:00			10:00					03:00			
Volume		78	12	1	2	2			2					90			
PM Volumes	0	616	101	0	5	0	0	0	1	0	0	0	0	723			
% PM		52%	8%		0%				0%					61%			
PM Peak Hour		16:00	16:00		12:00				21:00					16:00			
Volume		153	29		1				1					183			
Directional Peak Periods			AM 7-9				NOON 12-2				PM 4-6				Off Peak Volumes		
All Classes			Volume		%		Volume		%		Volume		%		Volume	%	
			121	↔	10%		100	↔	8%		243	↔	20%		731	↔	61%

Classification Definitions

1 Motorcycles	4 Buses	7 >=4-Axle Single Units	10 >=6-Axle Single Trailers	13 >=7-Axle Multi-Trailers
2 Passenger Cars	5 2-Axle, 6-Tire Single Units	8 <=4-Axle Single Trailers	11 <=5-Axle Multi-Trailers	
3 2-Axle, 4-Tire Single Units	6 3-Axle Single Units	9 5-Axle Single Trailers	12 6-Axle Multi-Trailers	

CLASSIFICATION

Casa Grande Dr Bet. Palmetto Ave & Tamarind Ave

Day: Tuesday
Date: 9/10/2019City: Fontana
Project #: CA19_6114_002w**West Bound**

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	0	5	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	10	0	0	0	0	0	0	0	0	0	0	0	10
02:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
03:00	0	14	1	0	0	0	0	0	0	0	0	0	0	15
04:00	0	19	3	0	0	0	0	0	0	0	0	0	0	22
05:00	0	130	20	0	5	0	0	0	0	0	0	0	0	155
06:00	0	25	4	0	0	0	0	0	0	0	0	0	0	29
07:00	0	58	6	0	2	0	0	0	0	0	0	0	0	66
08:00	0	29	6	0	0	0	0	0	0	0	0	0	0	35
09:00	0	30	6	0	0	0	0	0	0	0	0	0	0	36
10:00	0	26	6	0	0	0	0	0	0	0	0	0	0	32
11:00	0	40	10	0	2	0	0	0	0	0	0	0	0	52
12:00 PM	0	39	6	0	3	0	0	0	0	0	0	0	0	48
13:00	0	28	6	0	0	0	0	0	0	0	0	0	0	34
14:00	0	59	7	0	0	0	0	0	0	0	0	0	0	66
15:00	0	78	10	0	2	0	0	0	0	0	0	0	0	90
16:00	1	139	23	0	3	0	0	0	0	0	0	0	0	166
17:00	0	37	9	0	0	0	0	0	0	0	0	0	0	46
18:00	0	45	8	0	2	0	0	0	0	0	0	0	0	55
19:00	0	42	5	0	0	0	0	0	0	0	0	0	0	47
20:00	0	35	9	0	0	0	0	0	0	0	0	0	0	44
21:00	0	31	3	0	0	0	0	0	0	0	0	0	0	34
22:00	0	11	0	0	0	0	0	0	0	0	0	0	0	11
23:00	0	6	1	0	1	0	0	0	0	0	0	0	0	8
Totals	1	941	150		20									1112
% of Totals	0%	85%	13%		2%									100%

AM Volumes	0	391	63	0	9	0	0	0	0	0	0	0	0	463
% AM		35%	6%		1%									42%
AM Peak Hour		05:00	05:00		05:00									05:00
Volume		130	20		5									155
PM Volumes	1	550	87	0	11	0	0	0	0	0	0	0	0	649
% PM	0%	49%	8%		1%									58%
PM Peak Hour	16:00	16:00	16:00		12:00									16:00
Volume	1	139	23		3									166
Directional Peak Periods			AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Classes			Volume		%	Volume		%	Volume		%	Volume		%
			101	↔	9%	82	↔	7%	212	↔	19%	717	↔	64%

Classification Definitions

1 Motorcycles	4 Buses	7 >=4-Axle Single Units	10 >=6-Axle Single Trailers	13 >=7-Axle Multi-Trailers
2 Passenger Cars	5 2-Axle, 6-Tire Single Units	8 <=4-Axle Single Trailers	11 <=5-Axle Multi-Trailers	
3 2-Axle, 4-Tire Single Units	6 3-Axle Single Units	9 5-Axle Single Trailers	12 6-Axle Multi-Trailers	

National Data & Surveying Services

Intersection Turning Movement Count

Location: Sierra Ave & SR-210 WB Ramps
City: Fontana
Control: Signalized

Project ID: 19-06113-001
Date: 9/10/2019

Cars

NS/EW Streets:	Sierra Ave				Sierra Ave				SR-210 WB Ramps				SR-210 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	3	2	0	0	3	2	0	0	0	0	0	1.5	0	1.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	0	161	108	0	0	262	70	0	0	0	0	0	164	0	65	0	830
7:15 AM	0	203	111	0	0	264	61	0	0	0	0	0	144	0	45	0	828
7:30 AM	0	138	80	0	0	285	49	0	0	0	0	0	95	0	66	0	713
7:45 AM	0	144	61	0	0	250	51	0	0	0	0	0	148	0	82	0	736
8:00 AM	0	135	59	0	0	242	60	0	0	0	0	0	91	0	79	0	666
8:15 AM	0	151	71	0	0	221	54	0	0	0	0	0	79	0	68	0	644
8:30 AM	0	128	71	0	0	191	49	0	0	0	0	0	87	0	43	0	569
8:45 AM	0	145	74	0	0	204	37	0	0	0	0	0	96	0	57	0	613
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	1205	635	0	0	1919	431	0	0	0	0	0	904	0	505	0	5599
	0.00%	65.49%	34.51%	0.00%	0.00%	81.66%	18.34%	0.00%					64.16%	0.00%	35.84%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	646	360	0	0	1061	231	0	0	0	0	0	551	0	258	0	3107
PEAK HR FACTOR :	0.00	0.796	0.811	0.000	0.000	0.931	0.825	0.000	0.000	0.000	0.000	0.000	0.840	0.000	0.787	0.000	0.936
	0.801				0.967								0.879				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	3	2	0	0	3	2	0	0	0	0	0	1.5	0	1.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
4:00 PM	0	246	113	0	0	266	58	0	0	0	0	0	86	0	92	0	861
4:15 PM	0	288	99	0	0	269	55	0	0	0	0	0	98	0	94	0	903
4:30 PM	0	269	120	0	0	300	69	0	0	0	0	0	99	0	104	0	961
4:45 PM	0	269	114	0	0	251	55	0	0	0	0	0	95	0	108	0	892
5:00 PM	0	290	135	0	0	293	75	0	0	0	0	0	94	0	105	0	992
5:15 PM	0	273	124	0	0	254	66	0	0	0	0	0	87	0	123	0	927
5:30 PM	0	304	146	0	0	281	89	0	0	0	0	0	94	0	99	0	1013
5:45 PM	0	289	129	0	0	279	58	0	0	0	0	0	100	0	125	0	980
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	2228	980	0	0	2193	525	0	0	0	0	0	753	0	850	0	7529
	0.00%	69.45%	30.55%	0.00%	0.00%	80.68%	19.32%	0.00%					46.97%	0.00%	53.03%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	1156	534	0	0	1107	288	0	0	0	0	0	375	0	452	0	3912
PEAK HR FACTOR :	0.00	0.951	0.914	0.000	0.000	0.945	0.809	0.000	0.000	0.000	0.000	0.000	0.938	0.000	0.904	0.000	0.965
	0.939				0.943								0.919				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Sierra Ave & SR-210 WB Ramps
City: Fontana
Control: Signalized

Project ID: 19-06113-001
Date: 9/10/2019

2axle

NS/EW Streets:	Sierra Ave				Sierra Ave				SR-210 WB Ramps				SR-210 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	3 NT	2 NR	0 NU	0 SL	3 ST	2 SR	0 SU	0 EL	0 ET	0 ER	0 EU	1.5 WL	0 WT	1.5 WR	0 WU	
7:00 AM	0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	0	4
7:15 AM	0	2	1	0	0	2	0	0	0	0	0	0	0	0	1	0	6
7:30 AM	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	3
7:45 AM	0	3	1	0	0	4	0	0	0	0	0	0	0	0	0	0	8
8:00 AM	0	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	5
8:15 AM	0	4	0	0	0	4	1	0	0	0	0	0	0	0	2	0	11
8:30 AM	0	2	0	0	0	4	1	0	0	0	0	0	0	0	1	0	8
8:45 AM	0	2	0	0	0	5	0	0	0	0	0	0	0	0	0	0	7
TOTAL VOLUMES :	NL 0	NT 18	NR 3	NU 0	SL 0	ST 22	SR 3	SU 0	EL 0	ET 0	ER 0	EU 0	WL 1	WT 0	WR 5	WU 0	TOTAL 52
APPROACH %'s :	0.00%	85.71%	14.29%	0.00%	0.00%	88.00%	12.00%	0.00%					16.67%	0.00%	83.33%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	7	2	0	0	8	1	0	0	0	0	0	1	0	2	0	21
PEAK HR FACTOR :	0.000	0.583	0.500	0.000	0.000	0.500	0.250	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.500	0.000	0.656
	0.563				0.563								0.750				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	3 NT	2 NR	0 NU	0 SL	3 ST	2 SR	0 SU	0 EL	0 ET	0 ER	0 EU	1.5 WL	0 WT	1.5 WR	0 WU	
4:00 PM	0	3	0	0	0	1	1	0	0	0	0	0	2	0	1	0	8
4:15 PM	0	3	0	0	0	2	3	0	0	0	0	0	1	0	1	0	10
4:30 PM	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	6
4:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	4
5:00 PM	0	0	1	0	0	4	2	0	0	0	0	0	0	0	0	0	7
5:15 PM	0	2	0	0	0	1	0	0	0	0	0	0	1	0	0	0	4
5:30 PM	0	1	1	0	0	2	1	0	0	0	0	0	0	0	1	0	6
5:45 PM	0	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	4
TOTAL VOLUMES :	NL 0	NT 13	NR 3	NU 0	SL 0	ST 16	SR 7	SU 0	EL 0	ET 0	ER 0	EU 0	WL 5	WT 0	WR 5	WU 0	TOTAL 49
APPROACH %'s :	0.00%	81.25%	18.75%	0.00%	0.00%	69.57%	30.43%	0.00%					50.00%	0.00%	50.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	4	3	0	0	8	3	0	0	0	0	0	2	0	1	0	21
PEAK HR FACTOR :	0.00	0.500	0.750	0.000	0.000	0.500	0.375	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.250	0.000	0.750
	0.875				0.458								0.750				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Sierra Ave & SR-210 WB Ramps
City: Fontana
Control: Signalized

Project ID: 19-06113-001
Date: 9/10/2019

3axle

NS/EW Streets:	Sierra Ave				Sierra Ave				SR-210 WB Ramps				SR-210 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	3 NT	2 NR	0 NU	0 SL	3 ST	2 SR	0 SU	0 EL	0 ET	0 ER	0 EU	1.5 WL	0 WT	1.5 WR	0 WU	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
7:15 AM	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	4
7:30 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3
7:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2
8:00 AM	0	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0	6
8:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	3
8:30 AM	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	1	0	0	0	2	1	0	0	0	0	0	0	0	1	0	5
TOTAL VOLUMES :	NL 0	NT 5	NR 1	NU 0	SL 0	ST 12	SR 4	SU 0	EL 0	ET 0	ER 0	EU 0	WL 1	WT 0	WR 4	WU 0	TOTAL 27
APPROACH %'s :	0.00%	83.33%	16.67%	0.00%	0.00%	75.00%	25.00%	0.00%					20.00%	0.00%	80.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	3	1	0	0	4	0	0	0	0	0	0	1	0	1	0	10
PEAK HR FACTOR :	0.000	0.375	0.250	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.625
	0.333				0.500								0.500				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	3 NT	2 NR	0 NU	0 SL	3 ST	2 SR	0 SU	0 EL	0 ET	0 ER	0 EU	1.5 WL	0 WT	1.5 WR	0 WU	
4:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
4:30 PM	0	4	0	0	0	2	1	0	0	0	0	0	0	0	0	0	7
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2
5:15 PM	0	0	2	0	0	0	0	0	0	0	0	0	1	0	1	0	4
5:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TOTAL VOLUMES :	NL 0	NT 4	NR 2	NU 0	SL 0	ST 4	SR 5	SU 0	EL 0	ET 0	ER 0	EU 0	WL 1	WT 0	WR 3	WU 0	TOTAL 19
APPROACH %'s :	0.00%	66.67%	33.33%	0.00%	0.00%	44.44%	55.56%	0.00%					25.00%	0.00%	75.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	0	2	0	0	1	2	0	0	0	0	0	1	0	2	0	8
PEAK HR FACTOR :	0.00	0.000	0.250	0.000	0.000	0.250	0.500	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.500	0.000	0.500
	0.250				0.750								0.375				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Sierra Ave & SR-210 WB Ramps
City: Fontana
Control: Signalized

Project ID: 19-06113-001
Date: 9/10/2019

4axle

NS/EW Streets:	Sierra Ave				Sierra Ave				SR-210 WB Ramps				SR-210 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	3 NT	2 NR	0 NU	0 SL	3 ST	2 SR	0 SU	0 EL	0 ET	0 ER	0 EU	1.5 WL	0 WT	1.5 WR	0 WU	
7:00 AM	0	1	1	0	0	1	1	0	0	0	0	0	0	0	2	0	6
7:15 AM	0	6	0	0	0	1	2	0	0	0	0	0	0	0	3	0	12
7:30 AM	0	2	0	0	0	0	1	0	0	0	0	0	0	0	2	0	5
7:45 AM	0	1	2	0	0	2	0	0	0	0	0	0	0	0	3	0	8
8:00 AM	0	1	0	0	0	1	3	0	0	0	0	0	0	0	5	0	10
8:15 AM	0	5	1	0	0	1	2	0	0	0	0	0	0	0	2	0	11
8:30 AM	0	6	0	0	0	3	5	0	0	0	0	0	1	0	0	0	15
8:45 AM	0	1	0	0	0	0	1	0	0	0	0	0	2	0	0	0	4
TOTAL VOLUMES :	NL 0	NT 23	NR 4	NU 0	SL 0	ST 9	SR 15	SU 0	EL 0	ET 0	ER 0	EU 0	WL 3	WT 0	WR 17	WU 0	TOTAL 71
APPROACH %'s :	0.00%	85.19%	14.81%	0.00%	0.00%	37.50%	62.50%	0.00%					15.00%	0.00%	85.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	10	3	0	0	4	4	0	0	0	0	0	0	0	10	0	31
PEAK HR FACTOR :	0.000	0.417	0.375	0.000	0.000	0.500	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.833	0.000	0.646
	0.542				0.667								0.833				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	3 NT	2 NR	0 NU	0 SL	3 ST	2 SR	0 SU	0 EL	0 ET	0 ER	0 EU	1.5 WL	0 WT	1.5 WR	0 WU	
4:00 PM	0	5	1	0	0	0	2	0	0	0	0	0	0	0	0	0	8
4:15 PM	0	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	5
4:30 PM	0	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0	5
4:45 PM	0	2	1	0	0	1	2	0	0	0	0	0	0	0	0	0	6
5:00 PM	0	5	0	0	0	0	0	0	0	0	0	0	2	0	0	0	7
5:15 PM	0	1	0	0	0	1	2	0	0	0	0	0	0	0	0	0	4
5:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	3
5:45 PM	0	2	1	0	0	2	1	0	0	0	0	0	0	0	2	0	8
TOTAL VOLUMES :	NL 0	NT 20	NR 5	NU 0	SL 0	ST 7	SR 9	SU 0	EL 0	ET 0	ER 0	EU 0	WL 2	WT 0	WR 3	WU 0	TOTAL 46
APPROACH %'s :	0.00%	80.00%	20.00%	0.00%	0.00%	43.75%	56.25%	0.00%					40.00%	0.00%	60.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	8	1	0	0	5	3	0	0	0	0	0	2	0	3	0	22
PEAK HR FACTOR :	0.00	0.400	0.250	0.000	0.000	0.625	0.375	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.375	0.000	0.688
	0.450				0.667								0.625				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Sierra Ave & SR-210 EB Ramps
City: Fontana
Control: Signalized

Project ID: 19-06113-002
Date: 9/10/2019

Cars

NS/EW Streets:	Sierra Ave				Sierra Ave				SR-210 EB Ramps				SR-210 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	3	2	0	0	3	2	0	1.5	0	1.5	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	0	258	107	0	0	343	76	0	29	0	92	0	0	0	0	0	905
7:15 AM	0	258	106	0	0	330	81	0	30	0	79	0	0	0	0	0	884
7:30 AM	0	191	137	0	0	289	88	0	18	0	118	0	0	0	0	0	841
7:45 AM	0	169	82	0	0	318	76	0	39	0	129	0	0	0	0	0	813
8:00 AM	0	157	57	0	0	276	59	0	34	0	127	0	0	0	0	0	710
8:15 AM	0	187	83	0	0	238	54	0	41	0	118	0	0	0	0	0	721
8:30 AM	0	162	65	0	0	216	66	0	36	0	87	0	0	0	0	0	632
8:45 AM	0	185	61	0	0	250	42	0	39	0	81	0	0	0	0	0	658
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	1567	698	0	0	2260	542	0	266	0	831	0	0	0	0	0	6164
	0.00%	69.18%	30.82%	0.00%	0.00%	80.66%	19.34%	0.00%	24.25%	0.00%	75.75%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	876	432	0	0	1280	321	0	116	0	418	0	0	0	0	0	3443
PEAK HR FACTOR :	0.00	0.849	0.788	0.000	0.000	0.933	0.912	0.000	0.744	0.000	0.810	0.000	0.000	0.000	0.000	0.000	0.951
	0.896				0.955				0.795								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	3	2	0	0	3	2	0	1.5	0	1.5	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
4:00 PM	0	329	114	0	0	269	75	0	41	0	101	0	0	0	0	0	929
4:15 PM	0	322	148	0	0	284	90	0	60	0	112	0	0	0	0	0	1016
4:30 PM	0	340	153	0	0	286	95	0	33	0	125	0	0	0	0	0	1032
4:45 PM	0	351	149	0	0	275	83	0	42	0	122	0	0	0	0	0	1022
5:00 PM	0	377	171	0	0	276	113	0	47	0	108	0	0	0	0	0	1092
5:15 PM	0	361	146	0	0	246	86	0	45	0	91	0	0	0	0	0	975
5:30 PM	0	400	149	0	0	266	104	0	47	0	114	0	0	0	0	0	1080
5:45 PM	0	364	124	0	0	280	98	0	42	0	112	0	0	0	0	0	1020
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	2844	1154	0	0	2182	744	0	357	0	885	0	0	0	0	0	8166
	0.00%	71.14%	28.86%	0.00%	0.00%	74.57%	25.43%	0.00%	28.74%	0.00%	71.26%	0.00%					
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	0	1390	621	0	0	1121	381	0	182	0	467	0	0	0	0	0	4162
PEAK HR FACTOR :	0.00	0.922	0.908	0.000	0.000	0.980	0.843	0.000	0.758	0.000	0.934	0.000	0.000	0.000	0.000	0.000	0.953
	0.917				0.965				0.943								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Sierra Ave & SR-210 EB Ramps
City: Fontana
Control: Signalized

Project ID: 19-06113-002
Date: 9/10/2019

2axle

NS/EW Streets:	Sierra Ave				Sierra Ave				SR-210 EB Ramps				SR-210 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	3 NT	2 NR	0 NU	0 SL	3 ST	2 SR	0 SU	1.5 EL	0 ET	1.5 ER	0 EU	0 WL	0 WT	0 WR	0 WU	
7:00 AM	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2
7:15 AM	0	1	0	0	0	1	1	0	0	0	3	0	0	0	0	0	6
7:30 AM	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	3
7:45 AM	0	2	0	0	0	3	0	0	1	0	0	0	0	0	0	0	6
8:00 AM	0	2	0	0	0	1	0	0	2	0	1	0	0	0	0	0	6
8:15 AM	0	2	0	0	0	3	2	0	2	0	0	0	0	0	0	0	9
8:30 AM	0	1	1	0	0	2	1	0	0	0	2	0	0	0	0	0	7
8:45 AM	0	3	0	0	0	3	3	0	0	0	1	0	0	0	0	0	10
TOTAL VOLUMES :	NL 0	NT 11	NR 2	NU 0	SL 0	ST 16	SR 7	SU 0	EL 6	ET 0	ER 7	EU 0	WL 0	WT 0	WR 0	WU 0	TOTAL 49
APPROACH %'s :	0.00%	84.62%	15.38%	0.00%	0.00%	69.57%	30.43%	0.00%	46.15%	0.00%	53.85%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	3	1	0	0	7	1	0	2	0	3	0	0	0	0	0	17
PEAK HR FACTOR :	0.000	0.375	0.250	0.000	0.000	0.583	0.250	0.000	0.500	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.708
	0.500				0.667				0.417								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	3 NT	2 NR	0 NU	0 SL	3 ST	2 SR	0 SU	1.5 EL	0 ET	1.5 ER	0 EU	0 WL	0 WT	0 WR	0 WU	
4:00 PM	0	3	0	0	0	4	0	0	0	0	0	0	0	0	0	0	7
4:15 PM	0	2	2	0	0	2	2	0	2	0	1	0	0	0	0	0	11
4:30 PM	0	3	0	0	0	3	1	0	0	0	0	0	0	0	0	0	7
4:45 PM	0	0	2	0	0	1	2	0	0	0	2	0	0	0	0	0	7
5:00 PM	0	2	1	0	0	2	1	0	1	0	0	0	0	0	0	0	7
5:15 PM	0	1	1	0	0	2	1	0	0	0	0	0	0	0	0	0	5
5:30 PM	0	1	3	0	0	0	1	0	0	0	0	0	0	0	0	0	5
5:45 PM	0	1	2	0	0	2	0	0	0	0	0	0	0	0	0	0	5
TOTAL VOLUMES :	NL 0	NT 13	NR 11	NU 0	SL 0	ST 16	SR 8	SU 0	EL 3	ET 0	ER 3	EU 0	WL 0	WT 0	WR 0	WU 0	TOTAL 54
APPROACH %'s :	0.00%	54.17%	45.83%	0.00%	0.00%	66.67%	33.33%	0.00%	50.00%	0.00%	50.00%	0.00%					
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	0	7	5	0	0	8	6	0	3	0	3	0	0	0	0	0	32
PEAK HR FACTOR :	0.00	0.583	0.625	0.000	0.000	0.667	0.750	0.000	0.375	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.727
	0.750				0.875				0.500								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Sierra Ave & SR-210 EB Ramps
City: Fontana
Control: Signalized

Project ID: 19-06113-002
Date: 9/10/2019

3axle

NS/EW Streets:	Sierra Ave				Sierra Ave				SR-210 EB Ramps				SR-210 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	3 NT	2 NR	0 NU	0 SL	3 ST	2 SR	0 SU	1.5 EL	0 ET	1.5 ER	0 EU	0 WL	0 WT	0 WR	0 WU	
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	1	0	0	0	1	0	0	2	0	1	0	0	0	0	0	5
7:30 AM	0	1	0	0	0	0	2	0	0	0	1	0	0	0	0	0	4
7:45 AM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
8:00 AM	0	0	1	0	0	4	1	0	0	0	0	0	0	0	0	0	6
8:15 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
TOTAL VOLUMES :	NL 0	NT 3	NR 2	NU 0	SL 0	ST 6	SR 8	SU 0	EL 3	ET 0	ER 2	EU 0	WL 0	WT 0	WR 0	WU 0	TOTAL 24
APPROACH %'s :	0.00%	60.00%	40.00%	0.00%	0.00%	42.86%	57.14%	0.00%	60.00%	0.00%	40.00%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	3	0	0	0	2	3	0	2	0	2	0	0	0	0	0	12
PEAK HR FACTOR :	0.000	0.750	0.000	0.000	0.000	0.500	0.375	0.000	0.250	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.600
	0.750				0.625				0.333								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	3 NT	2 NR	0 NU	0 SL	3 ST	2 SR	0 SU	1.5 EL	0 ET	1.5 ER	0 EU	0 WL	0 WT	0 WR	0 WU	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	4
4:30 PM	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	3
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL VOLUMES :	NL 0	NT 3	NR 2	NU 0	SL 0	ST 3	SR 2	SU 0	EL 2	ET 0	ER 0	EU 0	WL 0	WT 0	WR 0	WU 0	TOTAL 12
APPROACH %'s :	0.00%	60.00%	40.00%	0.00%	0.00%	60.00%	40.00%	0.00%	100.00%	0.00%	0.00%	0.00%					
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	0	2	1	0	0	2	1	0	2	0	0	0	0	0	0	0	8
PEAK HR FACTOR :	0.00	0.500	0.250	0.000	0.000	0.500	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500
	0.750				0.375				0.250								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Sierra Ave & SR-210 EB Ramps
City: Fontana
Control: Signalized

Project ID: 19-06113-002
Date: 9/10/2019

4axle

NS/EW Streets:	Sierra Ave				Sierra Ave				SR-210 EB Ramps				SR-210 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	3 NT	2 NR	0 NU	0 SL	3 ST	2 SR	0 SU	1.5 EL	0 ET	1.5 ER	0 EU	0 WL	0 WT	0 WR	0 WU	
7:00 AM	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2
7:15 AM	0	3	0	0	0	1	0	0	3	0	1	0	0	0	0	0	8
7:30 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
7:45 AM	0	2	0	0	0	2	0	0	1	0	0	0	0	0	0	0	5
8:00 AM	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	3
8:15 AM	0	1	0	0	0	1	0	0	4	0	1	0	0	0	0	0	7
8:30 AM	0	3	0	0	0	2	2	0	3	0	0	0	0	0	0	0	10
8:45 AM	0	1	1	0	0	2	0	0	1	0	1	0	0	0	0	0	6
TOTAL VOLUMES :	NL 0	NT 11	NR 1	NU 0	SL 0	ST 10	SR 2	SU 0	EL 16	ET 0	ER 3	EU 0	WL 0	WT 0	WR 0	WU 0	TOTAL 43
APPROACH %'s :	0.00%	91.67%	8.33%	0.00%	0.00%	83.33%	16.67%	0.00%	84.21%	0.00%	15.79%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	5	0	0	0	4	0	0	7	0	1	0	0	0	0	0	17
PEAK HR FACTOR :	0.000	0.417	0.000	0.000	0.000	0.500	0.000	0.000	0.583	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.531
	0.417				0.500				0.500								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	3 NT	2 NR	0 NU	0 SL	3 ST	2 SR	0 SU	1.5 EL	0 ET	1.5 ER	0 EU	0 WL	0 WT	0 WR	0 WU	
4:00 PM	0	1	1	0	0	0	0	0	3	0	1	0	0	0	0	0	6
4:15 PM	0	3	1	0	0	0	1	0	1	0	0	0	0	0	0	0	6
4:30 PM	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3
4:45 PM	0	1	1	0	0	1	0	0	2	0	1	0	0	0	0	0	6
5:00 PM	0	3	0	0	0	2	0	0	2	0	0	0	0	0	0	0	7
5:15 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
5:30 PM	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	3
5:45 PM	0	1	0	0	0	0	2	0	1	0	0	0	0	0	0	0	4
TOTAL VOLUMES :	NL 0	NT 11	NR 3	NU 0	SL 0	ST 4	SR 5	SU 0	EL 12	ET 0	ER 2	EU 0	WL 0	WT 0	WR 0	WU 0	TOTAL 37
APPROACH %'s :	0.00%	78.57%	21.43%	0.00%	0.00%	44.44%	55.56%	0.00%	85.71%	0.00%	14.29%	0.00%					
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	0	8	2	0	0	3	1	0	7	0	1	0	0	0	0	0	22
PEAK HR FACTOR :	0.00	0.667	0.500	0.000	0.000	0.375	0.250	0.000	0.875	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.786
	0.625				0.500				0.667								

Existing Peak Hour Volumes - Classification Counts

2 Sierra Avenue at SR-210 WB Ramp

AM Peak Hour Volumes										PM Peak Hour Volumes									
		Truck Volumes							Total PCE Volume			Truck Volumes							Total PCE Volume
Passenger Vehicles		2-Axle 2	3-Axle 2.5	4-Axle 3.0	Total Trucks	Truck %-age	PCE	Average PCE		Passenger Vehicles	2-Axle 2	3-Axle 2.5	4-Axle 3.0	Total Trucks	Truck %-age	PCE	Average PCE		
NL	0	0	0	0	0	0.0%	0	0.0	0	0	0	0	0	0.0%	0	0.0	0		
NT	646	7	3	10	20	3.0%	52	2.6	698	1,156	4	0	8	12	1.0%	32	2.7	1,188	
NR	360	2	1	3	6	1.6%	16	2.7	376	534	3	2	1	6	1.1%	14	2.3	548	
SL	0	0	0	0	0	0.0%	0	0.0	0	0	0	0	0	0.0%	0	0.0	0		
ST	1,061	8	4	4	16	1.5%	38	2.4	1,099	1,107	8	1	5	14	1.2%	34	2.4	1,141	
SR	231	1	0	4	5	2.1%	14	2.8	245	288	3	2	3	8	2.7%	20	2.5	308	
EL	0	0	0	0	0	0.0%	0	0.0	0	0	0	0	0	0.0%	0	0.0	0		
ET	0	0	0	0	0	0.0%	0	0.0	0	0	0	0	0	0.0%	0	0.0	0		
ER	0	0	0	0	0	0.0%	0	0.0	0	0	0	0	0	0.0%	0	0.0	0		
WL	0	1	1	0	2	100.0%	5	2.5	5	375	2	1	2	5	1.3%	13	2.6	388	
WT	0	0	0	0	0	0.0%	0	0.0	0	0	0	0	0	0.0%	0	0.0	0		
WR	0	2	1	10	13	100.0%	37	2.8	37	452	1	2	3	6	1.3%	16	2.7	468	
North Leg Volumes										North Leg Volumes									
Approach	1,292	9	4	8	21		52		1,344	1,395	11	3	8	22		54		1,449	
Depart	646	9	4	20	33		89		735	1,608	5	2	11	18		48		1,656	
Total	1,938	18	8	28	54	2.7%	141	2.6	2,079	3,003	16	5	19	40	1.3%	102	2.6	3,105	
South Leg Volumes										South Leg Volumes									
Approach	1,006	9	4	13	26		68		1,074	1,690	7	2	9	18		46		1,736	
Depart	1,061	9	5	4	18		43		1,104	1,482	10	2	7	19		47		1,529	
Total	2,067	18	9	17	44	2.1%	111	2.5	2,178	3,172	17	4	16	37	1.2%	93	2.5	3,265	
East Leg Volumes										East Leg Volumes									
Approach	0	3	2	10	15		42		42	827	3	3	5	11		29		856	
Depart	360	2	1	3	6		16		376	534	3	2	1	6		14		548	
Total	360	5	3	13	21	5.5%	58	2.8	418	1,361	6	5	6	17	1.2%	43	2.5	1,404	
West Leg Volumes										West Leg Volumes									
Approach	0	0	0	0	0		0		0	0	0	0	0	0		0		0	
Depart	231	1	0	4	5		14		245	288	3	2	3	8		20		308	
Total	231	1	0	4	5	2.1%	14	2.8	245	288	3	2	3	8	2.7%	20	2.5	308	
All Legs										All Legs									
Approach	2,298	21	10	31	62		162		2,460	3,912	21	8	22	51		129		4,041	
Depart	2,298	21	10	31	62		162		2,460	3,912	21	8	22	51		129		4,041	
Total	4,596	42	20	62	124	2.6%	324	2.6	4,920	7,824	42	16	44	102	1.3%	258	2.5	8,082	

Existing Peak Hour Volumes - Classification Counts

3 Sierra Avenue at SR-210 EB Ramp

AM Peak Hour Volumes										PM Peak Hour Volumes									
		Truck Volumes							Total PCE Volume			Truck Volumes							Total PCE Volume
Passenger		2-Axle	3-Axle	4-Axle	Total	Truck		Average		Passenger	2-Axle	3-Axle	4-Axle	Total	Truck		Average		
Vehicles		2	2.5	3.0	Trucks	%-age	PCE	PCE		Vehicles	2	2.5	3.0	Trucks	%-age	PCE	PCE		
NL	0	0	0	0	0	0.0%	0	0.0	0	0	0	0	0	0.0%	0	0.0	0		
NT	876	3	3	5	11	1.2%	29	2.6	905	1,390	7	2	8	17	1.2%	43	2.5	1,433	
NR	432	1	0	0	1	0.2%	2	2.0	434	621	5	1	2	8	1.3%	19	2.4	640	
SL	0	0	0	0	0	0.0%	0	0.0	0	0	0	0	0	0.0%	0	0.0	0		
ST	1,280	7	2	4	13	1.0%	31	2.4	1,311	1,121	8	2	3	13	1.1%	30	2.3	1,151	
SR	321	1	3	0	4	1.2%	10	2.5	331	381	6	1	1	8	2.1%	18	2.3	399	
EL	116	2	2	7	11	8.7%	30	2.7	146	182	3	2	7	12	6.2%	32	2.7	214	
ET	0	0	0	0	0	0.0%	0	0.0	0	0	0	0	0	0.0%	0	0.0	0		
ER	418	3	2	1	6	1.4%	14	2.3	432	467	3	0	1	4	0.8%	9	2.3	476	
WL	0	0	0	0	0	0.0%	0	0.0	0	0	0	0	0	0.0%	0	0.0	0		
WT	0	0	0	0	0	0.0%	0	0.0	0	0	0	0	0	0.0%	0	0.0	0		
WR	0	0	0	0	0	0.0%	0	0.0	0	0	0	0	0	0.0%	0	0.0	0		
3,559										4,313									
North Leg Volumes																			
Approach	1,601	8	5	4	17		41		1,642	1,502	14	3	4	21		48		1,550	
Depart	992	5	5	12	22		59		1,051	1,572	10	4	15	29		75		1,647	
Total	2,593	13	10	16	39	1.5%	100	2.6	2,693	3,074	24	7	19	50	1.6%	123	2.5	3,197	
South Leg Volumes																			
Approach	1,308	4	3	5	12		31		1,339	2,011	12	3	10	25		62		2,073	
Depart	1,698	10	4	5	19		45		1,743	1,588	11	2	4	17		39		1,627	
Total	3,006	14	7	10	31	1.0%	76	2.5	3,082	3,599	23	5	14	42	1.2%	101	2.4	3,700	
East Leg Volumes																			
Approach	0	0	0	0	0		0		0	0	0	0	0		0		0		
Depart	432	1	0	0	1		2		434	621	5	1	2	8		19		640	
Total	432	1	0	0	1	0.2%	2	2.0	434	621	5	1	2	8	1.3%	19	2.4	640	
West Leg Volumes																			
Approach	534	5	4	8	17		44		578	649	6	2	8	16		41		690	
Depart	321	1	3	0	4		10		331	381	6	1	1	8		18		399	
Total	855	6	7	8	21	2.4%	54	2.6	909	1,030	12	3	9	24	2.3%	59	2.5	1,089	
All Legs																			
Approach	3,443	17	12	17	46		116		3,559	4,162	32	8	22	62		151		4,313	
Depart	3,443	17	12	17	46		116		3,559	4,162	32	8	22	62		151		4,313	
Total	6,886	34	24	34	92	1.3%	232	2.5	7,118	8,324	64	16	44	124	1.5%	302	2.4	8,626	

Int	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
2	0	698	376	0	1099	245	0	0	0	5	0	37	Sierra Avenue at SR-210 WB Ramp
3	0	905	434	0	1311	331	146	0	432	0	0	0	Sierra Avenue at SR-210 EB Ramp

Int	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
2	0	1188	548	0	1141	308	0	0	0	388	0	468	Sierra Avenue at SR-210 WB Ramp
3	0	1433	640	0	1151	399	214	0	476	0	0	0	Sierra Avenue at SR-210 EB Ramp

APPENDIX C

INTERSECTION ANALYSIS WORKSHEETS

Sierra and Casa Grande Warehouse

Vistro File: K:\...\Casa Grande_TBB_AM.vistro

Scenario 1 EX AM

Report File: K:\...\1 EX AM.pdf

5/5/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Sierra Avenue at SR-210 WB Ramp	Signalized	HCM 6th Edition	WB Right	0.241	7.3	A
3	Sierra Avenue at SR-210 EB Ramp	Signalized	HCM 6th Edition	EB Right	0.403	13.3	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 2: Sierra Avenue at SR-210 WB Ramp

Control Type:	Signalized	Delay (sec / veh):	7.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.241

Intersection Setup

Name	Sierra Avenue			Sierra Avenue								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue								
Base Volume Input [veh/h]	0	698	376	0	1099	245	0	0	0	5	0	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	698	376	0	1099	245	0	0	0	5	0	37
Peak Hour Factor	1.0000	0.9300	0.9700	1.0000	0.9300	0.9700	1.0000	1.0000	1.0000	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	188	97	0	295	63	0	0	0	1	0	10
Total Analysis Volume [veh/h]	0	751	388	0	1182	253	0	0	0	5	0	40
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	0	0	3	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	0	0	0	5	0	0
Maximum Green [s]	0	30	0	0	30	0	0	0	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	63	0	0	63	0	0	0	0	27	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	5	0	0
Pedestrian Clearance [s]	0	9	0	0	10	0	0	0	0	18	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No					No		
Maximum Recall		No			No					No		
Pedestrian Recall		No			No					No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C		L	C	R
C, Cycle Length [s]	90	90		90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	59	59		23	23	23
g / C, Green / Cycle	0.66	0.66		0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.15	0.23		0.00	0.01	0.01
s, saturation flow rate [veh/h]	5176	5176		1810	1615	1615
c, Capacity [veh/h]	3393	3393		462	413	413
d1, Uniform Delay [s]	6.25	6.92		25.01	25.25	25.25
k, delay calibration	0.50	0.50		0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.15	0.28		0.04	0.22	0.22
d3, Initial Queue Delay [s]	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.22	0.35		0.01	0.05	0.05
d, Delay for Lane Group [s/veh]	6.40	7.20		25.05	25.47	25.47
Lane Group LOS	A	A		C	C	C
Critical Lane Group	No	Yes		No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.72	3.01		0.08	0.34	0.34
50th-Percentile Queue Length [ft/ln]	43.11	75.33		2.11	8.60	8.60
95th-Percentile Queue Length [veh/ln]	3.10	5.42		0.15	0.62	0.62
95th-Percentile Queue Length [ft/ln]	77.59	135.60		3.79	15.48	15.48

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	6.40	0.00	0.00	7.20	0.00	0.00	0.00	0.00	25.05	0.00	25.47
Movement LOS		A			A					C		C
d_A, Approach Delay [s/veh]	6.40			7.20			0.00			25.43		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	7.31											
Intersection LOS	A											
Intersection V/C	0.241											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	2.865			2.870			1.425			2.144		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1311			1311			0			0		
d_b, Bicycle Delay [s]	5.34			5.34			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	1.973			2.210			4.132			4.207		
Bicycle LOS	A			B			D			D		

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Sierra Avenue at SR-210 EB Ramp

Control Type:	Signalized	Delay (sec / veh):	13.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.403

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Base Volume Input [veh/h]	0	905	434	0	1311	331	146	0	432	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	905	434	0	1311	331	146	0	432	0	0	0
Peak Hour Factor	1.0000	0.9600	0.9500	1.0000	0.9600	0.9500	0.9600	1.0000	0.9600	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	236	114	0	341	87	38	0	113	0	0	0
Total Analysis Volume [veh/h]	0	943	457	0	1366	348	152	0	450	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	7	0	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	5	0	0	0	0	0
Maximum Green [s]	0	30	0	0	30	0	30	0	0	0	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	58	0	0	58	0	32	0	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	9	0	18	0	0	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall		No			No		No					
Maximum Recall		No			No		No					
Pedestrian Recall		No			No		No					
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	
C, Cycle Length [s]	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	54	54	28	28	28	
g / C, Green / Cycle	0.60	0.60	0.31	0.31	0.31	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.26	0.08	0.14	0.14	
s, saturation flow rate [veh/h]	5176	5176	1810	1615	1615	
c, Capacity [veh/h]	3105	3105	563	502	502	
d1, Uniform Delay [s]	8.80	9.78	23.31	24.81	24.81	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.25	0.45	1.18	2.87	2.87	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.30	0.44	0.27	0.45	0.45	
d, Delay for Lane Group [s/veh]	9.06	10.24	24.49	27.68	27.68	
Lane Group LOS	A	B	C	C	C	
Critical Lane Group	No	Yes	No	Yes	No	
50th-Percentile Queue Length [veh/ln]	2.81	4.53	2.56	4.15	4.15	
50th-Percentile Queue Length [ft/ln]	70.19	113.31	64.09	103.73	103.73	
95th-Percentile Queue Length [veh/ln]	5.05	8.02	4.61	7.47	7.47	
95th-Percentile Queue Length [ft/ln]	126.35	200.60	115.36	186.71	186.71	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	9.06	0.00	0.00	10.24	0.00	24.49	0.00	27.68	0.00	0.00	0.00
Movement LOS		A			B		C		C			
d_A, Approach Delay [s/veh]	9.06			10.24			26.88			0.00		
Approach LOS	A			B			C			A		
d_I, Intersection Delay [s/veh]	13.30											
Intersection LOS	B											
Intersection V/C	0.403											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	2.980			2.938			2.279			1.425		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1200			1200			0			0		
d_b, Bicycle Delay [s]	7.20			7.20			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.078			2.311			5.126			4.132		
Bicycle LOS	B			B			F			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 58s

SG: 102 15s

SG: 6 58s

SG: 106 14s

SG: 7 32s

SG: 107 23s

Sierra and Casa Grande Warehouse

Vistro File: K:\...\Casa Grande_TBB_PM.vistro

Scenario 1 EX PM

Report File: K:\...\1 EX PM.pdf

5/5/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Sierra Avenue at SR-210 WB Ramp	Signalized	HCM 6th Edition	WB Right	0.415	16.2	B
3	Sierra Avenue at SR-210 EB Ramp	Signalized	HCM 6th Edition	EB Right	0.446	14.3	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 2: Sierra Avenue at SR-210 WB Ramp

Control Type:	Signalized	Delay (sec / veh):	16.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.415

Intersection Setup

Name	Sierra Avenue			Sierra Avenue								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue								
Base Volume Input [veh/h]	0	1188	548	0	1141	308	0	0	0	388	0	468
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1188	548	0	1141	308	0	0	0	388	0	468
Peak Hour Factor	1.0000	0.9700	0.9700	1.0000	0.9700	0.9700	1.0000	1.0000	1.0000	0.9700	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	306	141	0	294	79	0	0	0	100	0	121
Total Analysis Volume [veh/h]	0	1225	565	0	1176	318	0	0	0	400	0	482
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	0	0	3	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	0	0	0	5	0	0
Maximum Green [s]	0	30	0	0	30	0	0	0	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	51	0	0	51	0	0	0	0	39	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	5	0	0
Pedestrian Clearance [s]	0	9	0	0	10	0	0	0	0	18	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No					No		
Maximum Recall		No			No					No		
Pedestrian Recall		No			No					No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C		L	C	R
C, Cycle Length [s]	90	90		90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	47	47		35	35	35
g / C, Green / Cycle	0.52	0.52		0.39	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.24	0.23		0.17	0.17	0.18
s, saturation flow rate [veh/h]	5176	5176		1810	1676	1615
c, Capacity [veh/h]	2703	2703		704	652	628
d1, Uniform Delay [s]	13.46	13.29		20.16	20.36	20.46
k, delay calibration	0.50	0.50		0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.55	0.51		1.90	2.23	2.41
d3, Initial Queue Delay [s]	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.45	0.44		0.43	0.45	0.46
d, Delay for Lane Group [s/veh]	14.01	13.80		22.05	22.59	22.87
Lane Group LOS	B	B		C	C	C
Critical Lane Group	Yes	No		No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.98	4.72		4.84	4.80	4.78
50th-Percentile Queue Length [ft/ln]	124.62	118.10		121.03	119.93	119.40
95th-Percentile Queue Length [veh/ln]	8.65	8.29		8.45	8.39	8.36
95th-Percentile Queue Length [ft/ln]	216.15	207.21		211.24	209.74	209.00

Movement, Approach, & Intersection Results

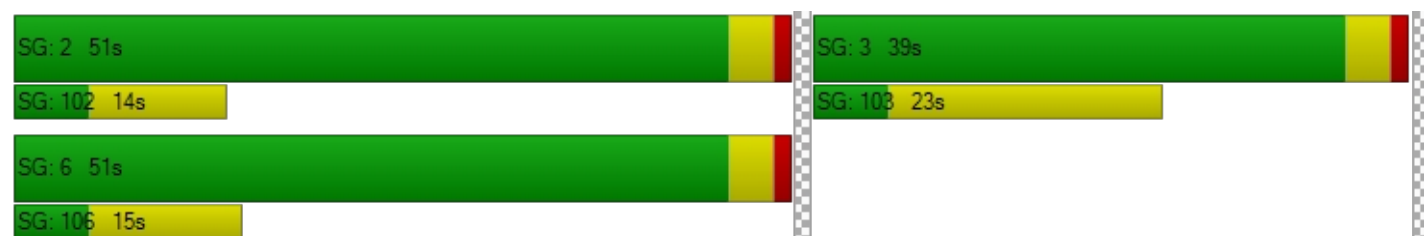
d_M, Delay for Movement [s/veh]	0.00	14.01	0.00	0.00	13.80	0.00	0.00	0.00	0.00	22.19	0.00	22.76
Movement LOS		B			B					C		C
d_A, Approach Delay [s/veh]	14.01			13.80			0.00			22.50		
Approach LOS	B			B			A			C		
d_I, Intersection Delay [s/veh]	16.22											
Intersection LOS	B											
Intersection V/C	0.415											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	2.986			2.997			1.425			2.348		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1044			1044			0			0		
d_b, Bicycle Delay [s]	10.27			10.27			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.233			2.206			4.132			5.588		
Bicycle LOS	B			B			D			F		

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Sierra Avenue at SR-210 EB Ramp

Control Type:	Signalized	Delay (sec / veh):	14.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.446

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Base Volume Input [veh/h]	0	1433	640	0	1151	399	214	0	476	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1433	640	0	1151	399	214	0	476	0	0	0
Peak Hour Factor	1.0000	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	1.0000	0.9500	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	377	168	0	303	105	56	0	125	0	0	0
Total Analysis Volume [veh/h]	0	1508	674	0	1212	420	225	0	501	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	7	0	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	5	0	0	0	0	0
Maximum Green [s]	0	30	0	0	30	0	30	0	0	0	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	57	0	0	57	0	33	0	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	9	0	18	0	0	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall		No			No		No					
Maximum Recall		No			No		No					
Pedestrian Recall		No			No		No					
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	
C, Cycle Length [s]	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	53	53	29	29	29	
g / C, Green / Cycle	0.59	0.59	0.32	0.32	0.32	
(v / s)_i Volume / Saturation Flow Rate	0.29	0.23	0.12	0.16	0.16	
s, saturation flow rate [veh/h]	5176	5176	1810	1615	1615	
c, Capacity [veh/h]	3048	3048	583	520	520	
d1, Uniform Delay [s]	10.73	9.93	23.61	24.47	24.47	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.58	0.39	1.93	3.17	3.17	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.49	0.40	0.39	0.48	0.48	
d, Delay for Lane Group [s/veh]	11.31	10.32	25.53	27.63	27.63	
Lane Group LOS	B	B	C	C	C	
Critical Lane Group	Yes	No	No	Yes	No	
50th-Percentile Queue Length [veh/ln]	5.41	4.01	3.92	4.63	4.63	
50th-Percentile Queue Length [ft/ln]	135.19	100.26	98.12	115.66	115.66	
95th-Percentile Queue Length [veh/ln]	9.22	7.22	7.06	8.15	8.15	
95th-Percentile Queue Length [ft/ln]	230.53	180.46	176.62	203.85	203.85	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	11.31	0.00	0.00	10.32	0.00	25.53	0.00	27.63	0.00	0.00	0.00
Movement LOS		B			B		C		C			
d_A, Approach Delay [s/veh]	11.31			10.32			26.98			0.00		
Approach LOS	B			B			C			A		
d_I, Intersection Delay [s/veh]	14.26											
Intersection LOS	B											
Intersection V/C	0.446											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.044			3.006			2.310			1.425		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1178			1178			0			0		
d_b, Bicycle Delay [s]	7.61			7.61			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.389			2.226			5.330			4.132		
Bicycle LOS	B			B			F			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 57s

SG: 102 15s

SG: 6 57s

SG: 106 14s

SG: 7 33s

SG: 107 23s

Sierra and Casa Grande Warehouse

Vistro File: K:\...\Casa Grande_TBB_AM.vistro

Scenario 2 EX WP AM

Report File: K:\...\2 EX WP AM.pdf

5/5/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Sierra Avenue at Casa Grande Drive	Two-way stop	HCM 6th Edition	WB Left	0.294	47.4	E
2	Sierra Avenue at SR-210 WB Ramp	Signalized	HCM 6th Edition	WB Right	0.247	7.5	A
3	Sierra Avenue at SR-210 EB Ramp	Signalized	HCM 6th Edition	EB Right	0.404	13.4	B
4	Sierra Ave / North Dwy	Two-way stop	HCM 6th Edition	WB Left	0.017	26.2	D
5	Sierra Ave / South Dwy	Two-way stop	HCM 6th Edition	WB Left	0.048	27.5	D
6	Casa Grande Dr / West Dwy	Two-way stop	HCM 6th Edition	SB Right	0.006	8.7	A
7	Casa Grande Dr / East Dwy	Two-way stop	HCM 6th Edition	SB Right	0.002	8.7	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Sierra Avenue at Casa Grande Drive

Control Type:	Two-way stop	Delay (sec / veh):	47.4
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.294

Intersection Setup

Name	Sierra Avenue		Sierra Avenue		Casa Grande Drive	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		Casa Grande Drive	
Base Volume Input [veh/h]	414	28	54	833	25	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	31	22	3	9	7	5
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	445	50	57	842	32	50
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	121	14	15	229	9	14
Total Analysis Volume [veh/h]	484	54	62	915	35	54
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.06	0.01	0.29	0.10
d_M, Delay for Movement [s/veh]	0.00	0.00	8.68	0.00	47.37	12.02
Movement LOS	A	A	A	A	E	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.19	0.00	1.13	0.31
95th-Percentile Queue Length [ft/ln]	0.00	0.00	4.75	0.00	28.20	7.86
d_A, Approach Delay [s/veh]	0.00		0.55		25.92	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	1.77					
Intersection LOS	E					

Intersection Level Of Service Report

Intersection 2: Sierra Avenue at SR-210 WB Ramp

Control Type:	Signalized	Delay (sec / veh):	7.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.247

Intersection Setup

Name	Sierra Avenue			Sierra Avenue								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue								
Base Volume Input [veh/h]	0	698	376	0	1099	245	0	0	0	5	0	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	34	0	0	8	6	0	0	0	0	0	15
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	732	376	0	1107	251	0	0	0	5	0	52
Peak Hour Factor	1.0000	0.9300	0.9700	1.0000	0.9300	0.9700	1.0000	1.0000	1.0000	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	197	97	0	298	65	0	0	0	1	0	14
Total Analysis Volume [veh/h]	0	787	388	0	1190	259	0	0	0	5	0	56
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	0	0	3	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	0	0	0	5	0	0
Maximum Green [s]	0	30	0	0	30	0	0	0	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	63	0	0	63	0	0	0	0	27	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	5	0	0
Pedestrian Clearance [s]	0	9	0	0	10	0	0	0	0	18	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No					No		
Maximum Recall		No			No					No		
Pedestrian Recall		No			No					No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C		L	C	R
C, Cycle Length [s]	90	90		90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	59	59		23	23	23
g / C, Green / Cycle	0.66	0.66		0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.15	0.23		0.00	0.02	0.02
s, saturation flow rate [veh/h]	5176	5176		1810	1615	1615
c, Capacity [veh/h]	3393	3393		462	413	413
d1, Uniform Delay [s]	6.30	6.93		25.01	25.38	25.38
k, delay calibration	0.50	0.50		0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	0.29		0.04	0.32	0.32
d3, Initial Queue Delay [s]	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.23	0.35		0.01	0.07	0.07
d, Delay for Lane Group [s/veh]	6.46	7.22		25.05	25.70	25.70
Lane Group LOS	A	A		C	C	C
Critical Lane Group	No	Yes		No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.82	3.04		0.08	0.48	0.48
50th-Percentile Queue Length [ft/ln]	45.55	76.00		2.11	12.11	12.11
95th-Percentile Queue Length [veh/ln]	3.28	5.47		0.15	0.87	0.87
95th-Percentile Queue Length [ft/ln]	81.99	136.79		3.79	21.80	21.80

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	6.46	0.00	0.00	7.22	0.00	0.00	0.00	0.00	25.05	0.00	25.70
Movement LOS		A			A					C		C
d_A, Approach Delay [s/veh]	6.46			7.22			0.00			25.64		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	7.48											
Intersection LOS	A											
Intersection V/C	0.247											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	2.871			2.879			1.425			2.147		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1311			1311			0			0		
d_b, Bicycle Delay [s]	5.34			5.34			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	1.992			2.214			4.132			4.233		
Bicycle LOS	A			B			D			D		

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Sierra Avenue at SR-210 EB Ramp

Control Type:	Signalized	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.404

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Base Volume Input [veh/h]	0	905	434	0	1311	331	146	0	432	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	17	0	0	3	5	17	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	922	434	0	1314	336	163	0	432	0	0	0
Peak Hour Factor	1.0000	0.9600	0.9500	1.0000	0.9600	0.9500	0.9600	1.0000	0.9600	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	240	114	0	342	88	42	0	113	0	0	0
Total Analysis Volume [veh/h]	0	960	457	0	1369	354	170	0	450	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	7	0	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	5	0	0	0	0	0
Maximum Green [s]	0	30	0	0	30	0	30	0	0	0	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	58	0	0	58	0	32	0	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	9	0	18	0	0	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall		No			No		No					
Maximum Recall		No			No		No					
Pedestrian Recall		No			No		No					
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	
C, Cycle Length [s]	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	54	54	28	28	28	
g / C, Green / Cycle	0.60	0.60	0.31	0.31	0.31	
(v / s)_i Volume / Saturation Flow Rate	0.19	0.26	0.09	0.14	0.14	
s, saturation flow rate [veh/h]	5176	5176	1810	1615	1615	
c, Capacity [veh/h]	3105	3105	563	502	502	
d1, Uniform Delay [s]	8.84	9.79	23.57	24.81	24.81	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.26	0.46	1.38	2.87	2.87	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.31	0.44	0.30	0.45	0.45	
d, Delay for Lane Group [s/veh]	9.10	10.25	24.95	27.68	27.68	
Lane Group LOS	A	B	C	C	C	
Critical Lane Group	No	Yes	No	Yes	No	
50th-Percentile Queue Length [veh/ln]	2.87	4.55	2.91	4.15	4.15	
50th-Percentile Queue Length [ft/ln]	71.75	113.65	72.64	103.73	103.73	
95th-Percentile Queue Length [veh/ln]	5.17	8.04	5.23	7.47	7.47	
95th-Percentile Queue Length [ft/ln]	129.16	201.07	130.75	186.71	186.71	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	9.10	0.00	0.00	10.25	0.00	24.95	0.00	27.68	0.00	0.00	0.00
Movement LOS		A			B		C		C			
d_A, Approach Delay [s/veh]	9.10			10.25			26.93			0.00		
Approach LOS	A			B			C			A		
d_I, Intersection Delay [s/veh]	13.38											
Intersection LOS	B											
Intersection V/C	0.404											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	2.982			2.943			2.284			1.425		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1200			1200			0			0		
d_b, Bicycle Delay [s]	7.20			7.20			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.088			2.313			5.155			4.132		
Bicycle LOS	B			B			F			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 58s

SG: 102 15s

SG: 6 58s

SG: 106 14s

SG: 7 32s

SG: 107 23s

Intersection Level Of Service Report
Intersection 4: Sierra Ave / North Dwy

Control Type: Two-way stop
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 26.2
 Level Of Service: D
 Volume to Capacity (v/c): 0.017

Intersection Setup

Name	Sierra Avenue		Sierra Avenue		North Dwy	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		North Dwy	
Base Volume Input [veh/h]	414	0	0	833	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	9	0	2	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	415	9	0	835	3	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	109	2	0	220	1	0
Total Analysis Volume [veh/h]	437	9	0	879	3	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.01	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	8.23	0.00	26.19	11.21
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.05	0.05
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	1.32	1.32
d_A, Approach Delay [s/veh]	0.00		0.00		26.19	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.06					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 5: Sierra Ave / South DwyControl Type: Two-way stop
Analysis Method: HCM 6th Edition
Analysis Period: 15 minutesDelay (sec / veh): 27.5
Level Of Service: D
Volume to Capacity (v/c): 0.048**Intersection Setup**

Name	Sierra Avenue		Sierra Avenue		South Dwy	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		South Dwy	
Base Volume Input [veh/h]	414	0	0	833	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	26	0	5	8	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	424	26	0	838	8	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	112	7	0	221	2	0
Total Analysis Volume [veh/h]	446	27	0	882	8	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.01	0.05	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	8.31	0.00	27.51	12.05
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.15	0.15
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	3.72	3.72
d_A, Approach Delay [s/veh]	0.00		0.00		27.51	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.16					
Intersection LOS	D					

Intersection Level Of Service Report

Intersection 6: Casa Grande Dr / West Dwy

Control Type:	Two-way stop	Delay (sec / veh):	8.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	West Dwy		Casa Grande Drive		Casa Grande Drive	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	West Dwy		Casa Grande Drive		Casa Grande Drive	
Base Volume Input [veh/h]	0	0	0	72	70	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	25	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	6	0	97	76	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	0	26	20	0
Total Analysis Volume [veh/h]	0	6	0	102	80	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	8.70	0.00	0.00	0.00	0.00
Movement LOS		A		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.02	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.46	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.70		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.28					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 7: Casa Grande Dr / East Dwy

Control Type: Two-way stop
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 8.7
 Level Of Service: A
 Volume to Capacity (v/c): 0.002

Intersection Setup

Name	East Dwy		Casa Grande Drive		Casa Grande Drive	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	East Dwy		Casa Grande Drive		Casa Grande Drive	
Base Volume Input [veh/h]	0	0	0	72	70	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	2	24	1	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	2	24	73	74	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	1	6	19	19	0
Total Analysis Volume [veh/h]	0	2	25	77	78	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.68	8.67	7.41	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.05	0.05	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.15	0.15	1.25	1.25	0.00	0.00
d_A, Approach Delay [s/veh]	8.67		1.82		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.11					
Intersection LOS	A					

Sierra and Casa Grande Warehouse

Vistro File: K:\...\Casa Grande_TBB_PM.vistro

Scenario 2 EX WP PM

Report File: K:\...\2 EX WP PM.pdf

5/5/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Sierra Avenue at Casa Grande Drive	Two-way stop	HCM 6th Edition	WB Left	0.401	45.6	E
2	Sierra Avenue at SR-210 WB Ramp	Signalized	HCM 6th Edition	WB Right	0.420	16.3	B
3	Sierra Avenue at SR-210 EB Ramp	Signalized	HCM 6th Edition	EB Right	0.448	14.3	B
4	Sierra Ave / North Dwy	Two-way stop	HCM 6th Edition	WB Left	0.047	24.7	C
5	Sierra Ave / South Dwy	Two-way stop	HCM 6th Edition	WB Left	0.155	27.7	D
6	Casa Grande Dr / West Dwy	Two-way stop	HCM 6th Edition	SB Right	0.020	8.7	A
7	Casa Grande Dr / East Dwy	Two-way stop	HCM 6th Edition	SB Right	0.006	8.6	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Sierra Avenue at Casa Grande Drive

Control Type:	Two-way stop	Delay (sec / veh):	45.6
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.401

Intersection Setup

Name	Sierra Avenue		Sierra Avenue		Casa Grande Drive	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		Casa Grande Drive	
Base Volume Input [veh/h]	717	40	26	461	31	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	13	8	5	33	22	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	730	48	31	494	53	24
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	198	13	8	134	14	7
Total Analysis Volume [veh/h]	793	52	34	537	58	26
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.04	0.01	0.40	0.07
d_M, Delay for Movement [s/veh]	0.00	0.00	9.70	0.00	45.61	15.21
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.13	0.00	1.73	0.22
95th-Percentile Queue Length [ft/ln]	0.00	0.00	3.32	0.00	43.27	5.50
d_A, Approach Delay [s/veh]	0.00		0.58		36.20	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	2.25					
Intersection LOS	E					

Intersection Level Of Service Report

Intersection 2: Sierra Avenue at SR-210 WB Ramp

Control Type:	Signalized	Delay (sec / veh):	16.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.420

Intersection Setup

Name	Sierra Avenue			Sierra Avenue								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue								
Base Volume Input [veh/h]	0	1188	548	0	1141	308	0	0	0	388	0	468
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	13	0	0	33	18	0	0	0	0	0	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1201	548	0	1174	326	0	0	0	388	0	474
Peak Hour Factor	1.0000	0.9700	0.9700	1.0000	0.9700	0.9700	1.0000	1.0000	1.0000	0.9700	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	310	141	0	303	84	0	0	0	100	0	122
Total Analysis Volume [veh/h]	0	1238	565	0	1210	336	0	0	0	400	0	489
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	0	0	3	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	0	0	0	5	0	0
Maximum Green [s]	0	30	0	0	30	0	0	0	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	51	0	0	51	0	0	0	0	39	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	5	0	0
Pedestrian Clearance [s]	0	9	0	0	10	0	0	0	0	18	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No					No		
Maximum Recall		No			No					No		
Pedestrian Recall		No			No					No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C		L	C	R
C, Cycle Length [s]	90	90		90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	47	47		35	35	35
g / C, Green / Cycle	0.52	0.52		0.39	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.24	0.23		0.17	0.18	0.18
s, saturation flow rate [veh/h]	5176	5176		1810	1674	1615
c, Capacity [veh/h]	2703	2703		704	651	628
d1, Uniform Delay [s]	13.50	13.41		20.18	20.40	20.50
k, delay calibration	0.50	0.50		0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.56	0.54		1.92	2.27	2.45
d3, Initial Queue Delay [s]	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.46	0.45		0.43	0.45	0.46
d, Delay for Lane Group [s/veh]	14.06	13.95		22.10	22.67	22.96
Lane Group LOS	B	B		C	C	C
Critical Lane Group	Yes	No		No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.05	4.90		4.88	4.85	4.83
50th-Percentile Queue Length [ft/ln]	126.37	122.60		122.01	121.20	120.82
95th-Percentile Queue Length [veh/ln]	8.74	8.54		8.50	8.46	8.44
95th-Percentile Queue Length [ft/ln]	218.55	213.40		212.59	211.47	210.95

Movement, Approach, & Intersection Results

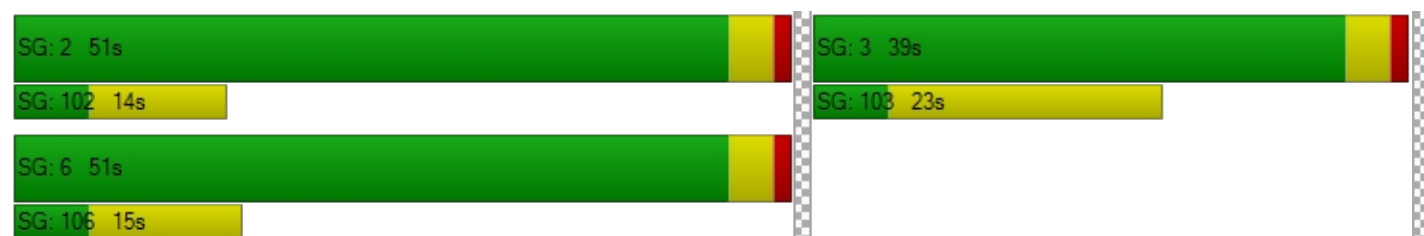
d_M, Delay for Movement [s/veh]	0.00	14.06	0.00	0.00	13.95	0.00	0.00	0.00	0.00	22.24	0.00	22.84
Movement LOS		B			B					C		C
d_A, Approach Delay [s/veh]	14.06			13.95			0.00			22.57		
Approach LOS	B			B			A			C		
d_I, Intersection Delay [s/veh]	16.29											
Intersection LOS	B											
Intersection V/C	0.420											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	2.992			3.004			1.425			2.349		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1044			1044			0			0		
d_b, Bicycle Delay [s]	10.27			10.27			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.241			2.225			4.132			5.599		
Bicycle LOS	B			B			D			F		

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Sierra Avenue at SR-210 EB Ramp

Control Type:	Signalized	Delay (sec / veh):	14.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.448

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Base Volume Input [veh/h]	0	1433	640	0	1151	399	214	0	476	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	0	0	17	16	6	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1440	640	0	1168	415	220	0	476	0	0	0
Peak Hour Factor	1.0000	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	1.0000	0.9500	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	379	168	0	307	109	58	0	125	0	0	0
Total Analysis Volume [veh/h]	0	1516	674	0	1229	437	232	0	501	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	7	0	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	5	0	0	0	0	0
Maximum Green [s]	0	30	0	0	30	0	30	0	0	0	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	57	0	0	57	0	33	0	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	9	0	18	0	0	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall		No			No		No					
Maximum Recall		No			No		No					
Pedestrian Recall		No			No		No					
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	
C, Cycle Length [s]	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	53	53	29	29	29	
g / C, Green / Cycle	0.59	0.59	0.32	0.32	0.32	
(v / s)_i Volume / Saturation Flow Rate	0.29	0.24	0.13	0.16	0.16	
s, saturation flow rate [veh/h]	5176	5176	1810	1615	1615	
c, Capacity [veh/h]	3048	3048	583	520	520	
d1, Uniform Delay [s]	10.76	9.97	23.71	24.47	24.47	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.58	0.40	2.02	3.17	3.17	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.50	0.40	0.40	0.48	0.48	
d, Delay for Lane Group [s/veh]	11.34	10.37	25.74	27.63	27.63	
Lane Group LOS	B	B	C	C	C	
Critical Lane Group	Yes	No	No	Yes	No	
50th-Percentile Queue Length [veh/ln]	5.45	4.08	4.07	4.63	4.63	
50th-Percentile Queue Length [ft/ln]	136.21	102.11	101.74	115.66	115.66	
95th-Percentile Queue Length [veh/ln]	9.28	7.35	7.33	8.15	8.15	
95th-Percentile Queue Length [ft/ln]	231.91	183.81	183.14	203.85	203.85	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	11.34	0.00	0.00	10.37	0.00	25.74	0.00	27.63	0.00	0.00	0.00
Movement LOS		B			B		C		C			
d_A, Approach Delay [s/veh]	11.34			10.37			27.03			0.00		
Approach LOS	B			B			C			A		
d_I, Intersection Delay [s/veh]	14.31											
Intersection LOS	B											
Intersection V/C	0.448											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.048			3.010			2.311			1.425		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1178			1178			0			0		
d_b, Bicycle Delay [s]	7.61			7.61			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.393			2.236			5.342			4.132		
Bicycle LOS	B			B			F			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 57s

SG: 102 15s

SG: 6 57s

SG: 106 14s

SG: 7 33s

SG: 107 23s

Intersection Level Of Service Report
Intersection 4: Sierra Ave / North Dwy

Control Type: Two-way stop
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 24.7
 Level Of Service: C
 Volume to Capacity (v/c): 0.047

Intersection Setup

Name	Sierra Avenue		Sierra Avenue		North Dwy	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		North Dwy	
Base Volume Input [veh/h]	717	0	0	461	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	3	0	1	9	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	720	3	0	462	9	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	189	1	0	122	2	0
Total Analysis Volume [veh/h]	758	3	0	486	9	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	9.23	0.00	24.68	14.78
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.15	0.15
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	3.67	3.67
d_A, Approach Delay [s/veh]	0.00		0.00		24.68	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.18					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 5: Sierra Ave / South DwyControl Type: Two-way stop
Analysis Method: HCM 6th Edition
Analysis Period: 15 minutesDelay (sec / veh): 27.7
Level Of Service: D
Volume to Capacity (v/c): 0.155**Intersection Setup**

Name	Sierra Avenue		Sierra Avenue		South Dwy	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		South Dwy	
Base Volume Input [veh/h]	717	0	0	461	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	6	11	0	10	28	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	723	11	0	471	28	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	190	3	0	124	7	0
Total Analysis Volume [veh/h]	761	12	0	496	29	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.15	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	9.27	0.00	27.71	17.44
Movement LOS	A	A	A	A	D	C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.54	0.54
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	13.38	13.38
d_A, Approach Delay [s/veh]	0.00		0.00		27.71	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.62					
Intersection LOS	D					

Intersection Level Of Service Report

Intersection 6: Casa Grande Dr / West Dwy

Control Type:	Two-way stop	Delay (sec / veh):	8.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.020

Intersection Setup

Name	West Dwy		Casa Grande Drive		Casa Grande Drive	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	West Dwy		Casa Grande Drive		Casa Grande Drive	
Base Volume Input [veh/h]	0	0	0	66	51	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	13	7	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	19	0	79	58	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	5	0	21	15	0
Total Analysis Volume [veh/h]	0	20	0	83	61	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.02	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	8.66	7.33	0.00	0.00	0.00
Movement LOS		A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.06	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	1.52	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.66		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.06					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 7: Casa Grande Dr / East Dwy

Control Type: Two-way stop
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 8.6
 Level Of Service: A
 Volume to Capacity (v/c): 0.006

Intersection Setup

Name			Casa Grande Drive		Casa Grande Drive	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name			Casa Grande Drive		Casa Grande Drive	
Base Volume Input [veh/h]	0	0	0	66	51	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	9	4	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	6	9	70	52	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	2	18	14	0
Total Analysis Volume [veh/h]	0	6	9	74	55	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.31	8.58	7.34	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.02	0.02	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.45	0.45	0.44	0.44	0.00	0.00
d_A, Approach Delay [s/veh]	8.58		0.80		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.82					
Intersection LOS	A					

Sierra and Casa Grande Warehouse

Vistro File: K:\...\Casa Grande_TBB_AM.vistro

Scenario 3 OY CUM AM

Report File: K:\...\3 OY CUM AM.pdf

5/5/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Sierra Avenue at Casa Grande Drive	Signalized	HCM 6th Edition	WB Left	0.606	11.9	B
2	Sierra Avenue at SR-210 WB Ramp	Signalized	HCM 6th Edition	WB Right	0.315	8.4	A
3	Sierra Avenue at SR-210 EB Ramp	Signalized	HCM 6th Edition	EB Right	0.431	14.0	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Sierra Avenue at Casa Grande Drive

Control Type:	Signalized	Delay (sec / veh):	11.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.606

Intersection Setup

Name	Sierra Avenue			Sierra Avenue							Casa Grande Drive		
Approach	Northbound			Southbound				Eastbound			Westbound		
Lane Configuration													
Turning Movement	Left	Thru	Right	U-tu	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.0	100.0	100.0	100.0	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00				30.00			30.00		
Grade [%]	0.00			0.00				0.00			0.00		
Curb Present	No			No				No			No		
Crosswalk	No			No				Yes			No		

Volumes

Name	Sierra Avenue			Sierra Avenue							Casa Grande Drive		
Base Volume Input [veh/h]	0	414	28	0	54	833	0	0	0	0	25	0	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0400	1.0400	1.0400	1.000	1.040	1.040	1.040	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	30	94	109	0	9	59	15	30	30	60	55	15	3
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	525	138	0	65	925	15	30	30	60	81	15	50
Peak Hour Factor	0.9200	0.9200	0.9200	1.000	0.920	0.920	0.920	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	143	38	0	18	251	4	8	8	16	22	4	14
Total Analysis Volume [veh/h]	33	571	150	0	71	1005	16	33	33	65	88	16	54
Presence of On-Street Parking	No		No	No			No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0				0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0				0			0		
v_co, Outbound Pedestrian Volume crossing	0			0				0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0				0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0				0			0		
Bicycle Volume [bicycles/h]	0			0				0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permi	Permi	Permi	Permi	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups													
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	75	0	0	0	75	0	0	15	0	0	15	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	0	9	0	0	10	0	0	10	0
Rest In Walk		No				No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No				No			No			No	
Maximum Recall		No				No			No			No	
Pedestrian Recall		No				No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	L	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	71	71	71	71	11	11	11	11
g / C, Green / Cycle	0.79	0.79	0.79	0.79	0.12	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.06	0.39	0.10	0.54	0.02	0.06	0.07	0.04
s, saturation flow rate [veh/h]	552	1833	743	1895	1330	1674	1318	1646
c, Capacity [veh/h]	367	1446	548	1495	161	205	140	201
d1, Uniform Delay [s]	11.03	3.31	6.82	4.35	40.69	36.83	43.61	36.21
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.48	1.23	0.49	2.55	2.85	7.83	19.55	4.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.09	0.50	0.13	0.68	0.20	0.48	0.63	0.35
d, Delay for Lane Group [s/veh]	11.51	4.54	7.31	6.90	43.54	44.65	63.16	40.91
Lane Group LOS	B	A	A	A	D	D	E	D
Critical Lane Group	No	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.37	3.34	0.57	6.36	0.82	2.43	2.71	1.66
50th-Percentile Queue Length [ft/ln]	9.23	83.49	14.36	158.95	20.61	60.72	67.64	41.40
95th-Percentile Queue Length [veh/ln]	0.66	6.01	1.03	10.49	1.48	4.37	4.87	2.98
95th-Percentile Queue Length [ft/ln]	16.62	150.29	25.85	262.34	37.10	109.30	121.76	74.52

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.51	4.54	4.54	7.31	7.31	6.90	6.90	43.54	44.65	44.65	63.16	40.91	40.91
Movement LOS	B	A	A	A	A	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	4.84			6.93				44.37			53.30		
Approach LOS	A			A				D			D		
d_I, Intersection Delay [s/veh]	11.92												
Intersection LOS	B												
Intersection V/C	0.606												

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0			0.0				9.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00				0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00				0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00				36.45			0.00		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000				2.052			0.000		
Crosswalk LOS	F			F				B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000				2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1578			1578				244			244		
d_b, Bicycle Delay [s]	2.01			2.01				34.67			34.67		
I_b,int, Bicycle LOS Score for Intersection	2.804			3.244				1.776			1.820		
Bicycle LOS	C			C				A			A		

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 75s

SG: 4 15s

SG: 6 75s

SG: 8 15s

SG: 10 14s

Intersection Level Of Service Report

Intersection 2: Sierra Avenue at SR-210 WB Ramp

Control Type:	Signalized	Delay (sec / veh):	8.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.315

Intersection Setup

Name	Sierra Avenue			Sierra Avenue								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue								
Base Volume Input [veh/h]	0	698	376	0	1099	245	0	0	0	5	0	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0000	1.0400	1.0400	1.0000	1.0400	1.0400	1.0000	1.0000	1.0000	1.0400	1.0000	1.0400
In-Process Volume [veh/h]	0	118	0	0	187	125	0	0	0	0	0	79
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	844	391	0	1330	380	0	0	0	5	0	117
Peak Hour Factor	1.0000	0.9300	0.9700	1.0000	0.9300	0.9700	1.0000	1.0000	1.0000	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	227	101	0	358	98	0	0	0	1	0	31
Total Analysis Volume [veh/h]	0	908	403	0	1430	392	0	0	0	5	0	126
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	0	0	3	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	0	0	0	5	0	0
Maximum Green [s]	0	30	0	0	30	0	0	0	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	63	0	0	63	0	0	0	0	27	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	5	0	0
Pedestrian Clearance [s]	0	9	0	0	10	0	0	0	0	18	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No					No		
Maximum Recall		No			No					No		
Pedestrian Recall		No			No					No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C		L	C	R
C, Cycle Length [s]	90	90		90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	59	59		23	23	23
g / C, Green / Cycle	0.66	0.66		0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.18	0.28		0.00	0.04	0.04
s, saturation flow rate [veh/h]	5176	5176		1810	1615	1615
c, Capacity [veh/h]	3393	3393		462	413	413
d1, Uniform Delay [s]	6.47	7.38		25.01	25.95	25.95
k, delay calibration	0.50	0.50		0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.19	0.39		0.04	0.78	0.78
d3, Initial Queue Delay [s]	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.27	0.42		0.01	0.15	0.15
d, Delay for Lane Group [s/veh]	6.67	7.76		25.05	26.74	26.74
Lane Group LOS	A	A		C	C	C
Critical Lane Group	No	Yes		No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.16	3.89		0.08	1.12	1.12
50th-Percentile Queue Length [ft/ln]	54.08	97.33		2.11	28.02	28.02
95th-Percentile Queue Length [veh/ln]	3.89	7.01		0.15	2.02	2.02
95th-Percentile Queue Length [ft/ln]	97.34	175.20		3.79	50.44	50.44

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	6.67	0.00	0.00	7.76	0.00	0.00	0.00	0.00	25.05	0.00	26.74
Movement LOS		A			A					C		C
d_A, Approach Delay [s/veh]	6.67			7.76			0.00			26.67		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	8.36											
Intersection LOS	A											
Intersection V/C	0.315											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	2.922			2.939			1.425			2.165		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1311			1311			0			0		
d_b, Bicycle Delay [s]	5.34			5.34			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.059			2.346			4.132			4.349		
Bicycle LOS	B			B			D			E		

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Sierra Avenue at SR-210 EB Ramp

Control Type:	Signalized	Delay (sec / veh):	14.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.431

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Base Volume Input [veh/h]	0	905	434	0	1311	331	146	0	432	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0400	1.0000	1.0400	1.0400	1.0400	1.0000	1.0400	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	30	0	0	60	128	88	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	971	451	0	1423	472	240	0	449	0	0	0
Peak Hour Factor	1.0000	0.9600	0.9500	1.0000	0.9600	0.9500	0.9600	1.0000	0.9600	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	253	119	0	371	124	63	0	117	0	0	0
Total Analysis Volume [veh/h]	0	1011	475	0	1482	497	250	0	468	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	7	0	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	5	0	0	0	0	0
Maximum Green [s]	0	30	0	0	30	0	30	0	0	0	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	58	0	0	58	0	32	0	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	9	0	18	0	0	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall		No			No		No					
Maximum Recall		No			No		No					
Pedestrian Recall		No			No		No					
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	
C, Cycle Length [s]	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	54	54	28	28	28	
g / C, Green / Cycle	0.60	0.60	0.31	0.31	0.31	
(v / s)_i Volume / Saturation Flow Rate	0.20	0.29	0.14	0.14	0.14	
s, saturation flow rate [veh/h]	5176	5176	1810	1615	1615	
c, Capacity [veh/h]	3105	3105	563	502	502	
d1, Uniform Delay [s]	8.95	10.09	24.78	24.97	24.97	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.28	0.53	2.53	3.08	3.08	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.33	0.48	0.44	0.47	0.47	
d, Delay for Lane Group [s/veh]	9.23	10.62	27.31	28.06	28.06	
Lane Group LOS	A	B	C	C	C	
Critical Lane Group	No	Yes	No	Yes	No	
50th-Percentile Queue Length [veh/ln]	3.06	5.08	4.55	4.35	4.35	
50th-Percentile Queue Length [ft/ln]	76.51	126.94	113.86	108.85	108.85	
95th-Percentile Queue Length [veh/ln]	5.51	8.77	8.05	7.78	7.78	
95th-Percentile Queue Length [ft/ln]	137.72	219.32	201.36	194.40	194.40	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	9.23	0.00	0.00	10.62	0.00	27.34	0.00	28.06	0.00	0.00	0.00
Movement LOS		A			B		C		C			
d_A, Approach Delay [s/veh]	9.23			10.62			27.80			0.00		
Approach LOS	A			B			C			A		
d_I, Intersection Delay [s/veh]	14.02											
Intersection LOS	B											
Intersection V/C	0.431											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.008			2.977			2.308			1.425		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1200			1200			0			0		
d_b, Bicycle Delay [s]	7.20			7.20			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.116			2.375			5.317			4.132		
Bicycle LOS	B			B			F			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 58s

SG: 102 15s

SG: 6 58s

SG: 106 14s

SG: 7 32s

SG: 107 23s

Sierra and Casa Grande Warehouse

Vistro File: K:\...\Casa Grande_TBB_PM.vistro

Scenario 3 OY CUM PM

Report File: K:\...\3 OY CUM PM.pdf

5/5/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Sierra Avenue at Casa Grande Drive	Signalized	HCM 6th Edition	WB Left	0.591	10.0	B
2	Sierra Avenue at SR-210 WB Ramp	Signalized	HCM 6th Edition	WB Right	0.507	17.5	B
3	Sierra Avenue at SR-210 EB Ramp	Signalized	HCM 6th Edition	EB Right	0.501	15.7	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Sierra Avenue at Casa Grande Drive

Control Type:	Signalized	Delay (sec / veh):	10.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.591

Intersection Setup

Name	Sierra Avenue			Sierra Avenue							Casa Grande Drive		
Approach	Northbound			Southbound				Eastbound			Westbound		
Lane Configuration													
Turning Movement	Left	Thru	Right	U-tu	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.0	100.0	100.0	100.0	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00				30.00			30.00		
Grade [%]	0.00			0.00				0.00			0.00		
Curb Present	No			No				No			No		
Crosswalk	No			No				Yes			No		

Volumes

Name	Sierra Avenue			Sierra Avenue							Casa Grande Drive		
Base Volume Input [veh/h]	0	717	40	0	26	461	0	0	0	0	31	0	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0400	1.0400	1.0400	1.000	1.040	1.040	1.040	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	66	76	75	0	4	104	33	21	21	42	20	33	9
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	822	117	0	31	583	33	21	21	42	52	33	30
Peak Hour Factor	0.9200	0.9200	0.9200	1.000	0.920	0.920	0.920	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	223	32	0	8	158	9	6	6	11	14	9	8
Total Analysis Volume [veh/h]	72	893	127	0	34	634	36	23	23	46	57	36	33
Presence of On-Street Parking	No		No	No			No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0				0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0				0			0		
v_co, Outbound Pedestrian Volume crossing	0			0				0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0				0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0				0			0		
Bicycle Volume [bicycles/h]	0			0				0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permi	Permi	Permi	Permi	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups													
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	75	0	0	0	75	0	0	15	0	0	15	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	0	9	0	0	10	0	0	10	0
Rest In Walk		No				No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No				No			No			No	
Maximum Recall		No				No			No			No	
Pedestrian Recall		No				No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	L	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	71	71	71	71	11	11	11	11
g / C, Green / Cycle	0.79	0.79	0.79	0.79	0.12	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.09	0.55	0.06	0.36	0.02	0.04	0.04	0.04
s, saturation flow rate [veh/h]	767	1859	562	1882	1332	1673	1353	1724
c, Capacity [veh/h]	579	1467	366	1485	164	204	164	211
d1, Uniform Delay [s]	6.08	4.44	11.50	3.11	40.17	36.16	41.31	36.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.44	2.75	0.50	0.99	1.77	4.42	5.72	4.10
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.12	0.70	0.09	0.45	0.14	0.34	0.35	0.33
d, Delay for Lane Group [s/veh]	6.53	7.19	12.00	4.11	41.94	40.58	47.03	40.22
Lane Group LOS	A	A	B	A	D	D	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.54	6.53	0.39	2.90	0.56	1.62	1.48	1.61
50th-Percentile Queue Length [ft/ln]	13.43	163.21	9.75	72.49	14.04	40.57	37.11	40.25
95th-Percentile Queue Length [veh/ln]	0.97	10.72	0.70	5.22	1.01	2.92	2.67	2.90
95th-Percentile Queue Length [ft/ln]	24.17	267.97	17.55	130.48	25.26	73.02	66.79	72.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.53	7.19	7.19	12.00	12.00	4.11	4.11	41.94	40.58	40.58	47.03	40.22	40.22
Movement LOS	A	A	A	B	B	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	7.15			4.49				40.92			43.30		
Approach LOS	A			A				D			D		
d_I, Intersection Delay [s/veh]	10.02												
Intersection LOS	B												
Intersection V/C	0.591												

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			9.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			36.45			0.00		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.121			0.000		
Crosswalk LOS	F			F			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1578			1578			244			244		
d_b, Bicycle Delay [s]	2.01			2.01			34.67			34.67		
I_b,int, Bicycle LOS Score for Intersection	3.361			2.665			1.711			1.768		
Bicycle LOS	C			B			A			A		

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 2: Sierra Avenue at SR-210 WB Ramp

Control Type:	Signalized	Delay (sec / veh):	17.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.507

Intersection Setup

Name	Sierra Avenue			Sierra Avenue								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue								
Base Volume Input [veh/h]	0	1188	548	0	1141	308	0	0	0	388	0	468
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0000	1.0400	1.0400	1.0000	1.0400	1.0400	1.0000	1.0000	1.0000	1.0400	1.0000	1.0400
In-Process Volume [veh/h]	0	209	0	0	152	102	0	0	0	0	0	139
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1445	570	0	1339	422	0	0	0	404	0	626
Peak Hour Factor	1.0000	0.9700	0.9700	1.0000	0.9700	0.9700	1.0000	1.0000	1.0000	0.9700	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	372	147	0	345	109	0	0	0	104	0	161
Total Analysis Volume [veh/h]	0	1490	588	0	1380	435	0	0	0	416	0	645
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	0	0	3	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	0	0	0	5	0	0
Maximum Green [s]	0	30	0	0	30	0	0	0	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	51	0	0	51	0	0	0	0	39	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	5	0	0
Pedestrian Clearance [s]	0	9	0	0	10	0	0	0	0	18	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No					No		
Maximum Recall		No			No					No		
Pedestrian Recall		No			No					No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C		L	C	R
C, Cycle Length [s]	90	90		90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	47	47		35	35	35
g / C, Green / Cycle	0.52	0.52		0.39	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.29	0.27		0.20	0.21	0.22
s, saturation flow rate [veh/h]	5176	5176		1810	1646	1615
c, Capacity [veh/h]	2703	2703		704	640	628
d1, Uniform Delay [s]	14.43	14.01		20.89	21.40	21.52
k, delay calibration	0.50	0.50		0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.81	0.69		2.56	3.41	3.63
d3, Initial Queue Delay [s]	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.55	0.51		0.50	0.55	0.56
d, Delay for Lane Group [s/veh]	15.24	14.70		23.44	24.82	25.14
Lane Group LOS	B	B		C	C	C
Critical Lane Group	Yes	No		No	No	Yes
50th-Percentile Queue Length [veh/ln]	6.52	5.86		5.95	6.19	6.24
50th-Percentile Queue Length [ft/ln]	163.08	146.41		148.69	154.74	156.12
95th-Percentile Queue Length [veh/ln]	10.71	9.83		9.95	10.27	10.34
95th-Percentile Queue Length [ft/ln]	267.79	245.63		248.68	256.74	258.58

Movement, Approach, & Intersection Results

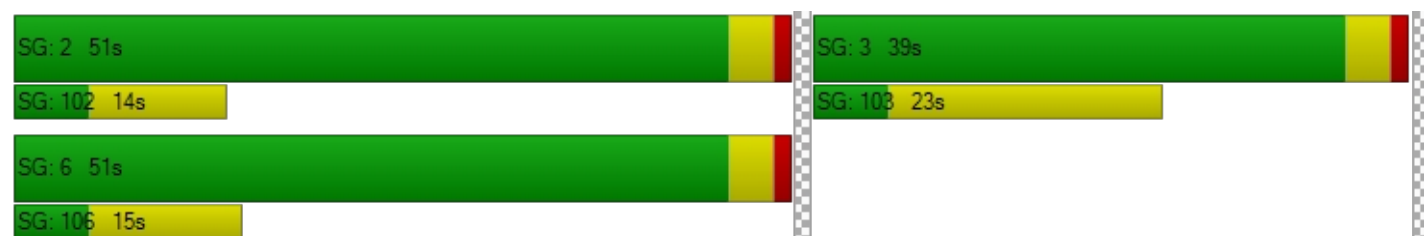
d_M, Delay for Movement [s/veh]	0.00	15.24	0.00	0.00	14.70	0.00	0.00	0.00	0.00	23.65	0.00	25.00
Movement LOS		B			B					C		C
d_A, Approach Delay [s/veh]	15.24			14.70			0.00			24.47		
Approach LOS	B			B			A			C		
d_I, Intersection Delay [s/veh]	17.54											
Intersection LOS	B											
Intersection V/C	0.507											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.053			3.085			1.425			2.391		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1044			1044			0			0		
d_b, Bicycle Delay [s]	10.27			10.27			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.379			2.319			4.132			5.883		
Bicycle LOS	B			B			D			F		

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Sierra Avenue at SR-210 EB Ramp

Control Type:	Signalized	Delay (sec / veh):	15.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.501

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Base Volume Input [veh/h]	0	1433	640	0	1151	399	214	0	476	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0400	1.0000	1.0400	1.0400	1.0400	1.0000	1.0400	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	66	0	0	42	110	143	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1556	666	0	1239	525	366	0	495	0	0	0
Peak Hour Factor	1.0000	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	1.0000	0.9500	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	409	175	0	326	138	96	0	130	0	0	0
Total Analysis Volume [veh/h]	0	1638	701	0	1304	553	385	0	521	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	7	0	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	5	0	0	0	0	0
Maximum Green [s]	0	30	0	0	30	0	30	0	0	0	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	56	0	0	56	0	34	0	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	9	0	18	0	0	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall		No			No		No					
Maximum Recall		No			No		No					
Pedestrian Recall		No			No		No					
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	
C, Cycle Length [s]	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	52	52	30	30	30	
g / C, Green / Cycle	0.58	0.58	0.33	0.33	0.33	
(v / s)_i Volume / Saturation Flow Rate	0.32	0.25	0.17	0.18	0.18	
s, saturation flow rate [veh/h]	5176	5176	1810	1661	1615	
c, Capacity [veh/h]	2990	2990	603	554	538	
d1, Uniform Delay [s]	11.74	10.72	24.10	24.42	24.53	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.73	0.46	3.06	3.79	4.06	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.55	0.44	0.51	0.54	0.55	
d, Delay for Lane Group [s/veh]	12.46	11.19	27.16	28.20	28.59	
Lane Group LOS	B	B	C	C	C	
Critical Lane Group	Yes	No	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	6.33	4.59	5.62	5.64	5.64	
50th-Percentile Queue Length [ft/ln]	158.23	114.66	140.50	140.93	141.12	
95th-Percentile Queue Length [veh/ln]	10.46	8.10	9.51	9.53	9.54	
95th-Percentile Queue Length [ft/ln]	261.38	202.46	237.70	238.27	238.53	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	12.46	0.00	0.00	11.19	0.00	27.38	0.00	28.43	0.00	0.00	0.00
Movement LOS		B			B		C		C			
d_A, Approach Delay [s/veh]	12.46			11.19			27.98			0.00		
Approach LOS	B			B			C			A		
d_I, Intersection Delay [s/veh]	15.68											
Intersection LOS	B											
Intersection V/C	0.501											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.078			3.059			2.353			1.425		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1156			1156			0			0		
d_b, Bicycle Delay [s]	8.02			8.02			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.461			2.277			5.627			4.132		
Bicycle LOS	B			B			F			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 56s

SG: 102 15s

SG: 6 56s

SG: 106 14s

SG: 7 34s

SG: 107 23s

Sierra and Casa Grande Warehouse

Vistro File: K:\...\Casa Grande_TBB_AM.vistro

Scenario 4 OY CUM WP AM

Report File: K:\...\4 OY CUM WP AM.pdf

5/5/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Sierra Avenue at Casa Grande Drive	Signalized	HCM 6th Edition	WB Left	0.616	12.0	B
2	Sierra Avenue at SR-210 WB Ramp	Signalized	HCM 6th Edition	WB Right	0.322	8.5	A
3	Sierra Avenue at SR-210 EB Ramp	Signalized	HCM 6th Edition	EB Right	0.434	14.1	B
4	Sierra Ave / North Dwy	Two-way stop	HCM 6th Edition	WB Left	0.010	17.1	C
5	Sierra Ave / South Dwy	Two-way stop	HCM 6th Edition	WB Left	0.033	20.2	C
6	Casa Grande Dr / West Dwy	Two-way stop	HCM 6th Edition	SB Right	0.007	9.1	A
7	Casa Grande Dr / East Dwy	Two-way stop	HCM 6th Edition	SB Right	0.002	9.1	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Sierra Avenue at Casa Grande Drive

Control Type:	Signalized	Delay (sec / veh):	12.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.616

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			Eastbound			Casa Grande Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			No		

Volumes

Name	Sierra Avenue			Sierra Avenue			Eastbound			Casa Grande Drive		
Base Volume Input [veh/h]	0	414	28	54	833	0	0	0	0	25	0	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
Growth Factor	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	30	94	109	9	59	15	30	30	60	55	15	3
Site-Generated Trips [veh/h]	0	31	22	3	9	0	0	0	0	7	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	556	160	68	934	15	30	30	60	88	15	55
Peak Hour Factor	1.0000	0.9200	0.9200	0.9200	0.9200	1.0000	1.0000	1.0000	1.0000	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	151	43	18	254	4	8	8	15	24	4	15
Total Analysis Volume [veh/h]	30	604	174	74	1015	15	30	30	60	96	15	60
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	75	0	0	75	0	0	15	0	0	15	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	9	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	L	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	71	71	71	71	11	11	11	11
g / C, Green / Cycle	0.79	0.79	0.79	0.79	0.12	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.05	0.43	0.10	0.54	0.02	0.05	0.07	0.05
s, saturation flow rate [veh/h]	548	1828	705	1895	1346	1700	1327	1665
c, Capacity [veh/h]	362	1442	510	1495	159	208	148	203
d1, Uniform Delay [s]	11.18	3.49	7.64	4.39	40.79	36.61	43.39	36.31
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.45	1.45	0.60	2.62	2.62	6.46	20.11	5.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.08	0.54	0.15	0.69	0.19	0.43	0.65	0.37
d, Delay for Lane Group [s/veh]	11.63	4.94	8.24	7.01	43.41	43.07	63.50	41.38
Lane Group LOS	B	A	A	A	D	D	E	D
Critical Lane Group	No	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.34	3.82	0.65	6.49	0.75	2.18	2.95	1.78
50th-Percentile Queue Length [ft/ln]	8.45	95.60	16.30	162.19	18.73	54.60	73.69	44.59
95th-Percentile Queue Length [veh/ln]	0.61	6.88	1.17	10.66	1.35	3.93	5.31	3.21
95th-Percentile Queue Length [ft/ln]	15.22	172.08	29.34	266.62	33.72	98.28	132.65	80.27

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.63	4.94	4.94	8.24	7.01	7.01	43.41	43.07	43.07	63.50	41.38	41.38
Movement LOS	B	A	A	A	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	5.19			7.09			43.15			53.80		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	11.99											
Intersection LOS	B											
Intersection V/C	0.616											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			9.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			36.45			0.00		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.043			0.000		
Crosswalk LOS	F			F			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1578			1578			244			244		
d_b, Bicycle Delay [s]	2.01			2.01			34.67			34.67		
I_b,int, Bicycle LOS Score for Intersection	2.893			3.381			1.758			1.842		
Bicycle LOS	C			C			A			A		

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 2: Sierra Avenue at SR-210 WB Ramp

Control Type:	Signalized	Delay (sec / veh):	8.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.322

Intersection Setup

Name	Sierra Avenue			Sierra Avenue								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue								
Base Volume Input [veh/h]	0	698	376	0	1099	245	0	0	0	5	0	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0000	1.0400	1.0400	1.0000	1.0400	1.0400	1.0000	1.0000	1.0000	1.0400	1.0000	1.0400
In-Process Volume [veh/h]	0	118	0	0	187	125	0	0	0	0	0	79
Site-Generated Trips [veh/h]	0	34	0	0	8	6	0	0	0	0	0	15
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	878	391	0	1338	386	0	0	0	5	0	132
Peak Hour Factor	1.0000	0.9300	0.9700	1.0000	0.9300	0.9700	1.0000	1.0000	1.0000	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	236	101	0	360	99	0	0	0	1	0	35
Total Analysis Volume [veh/h]	0	944	403	0	1439	398	0	0	0	5	0	142
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	0	0	3	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	0	0	0	5	0	0
Maximum Green [s]	0	30	0	0	30	0	0	0	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	63	0	0	63	0	0	0	0	27	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	5	0	0
Pedestrian Clearance [s]	0	9	0	0	10	0	0	0	0	18	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No					No		
Maximum Recall		No			No					No		
Pedestrian Recall		No			No					No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C		L	C	R
C, Cycle Length [s]	90	90		90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	59	59		23	23	23
g / C, Green / Cycle	0.66	0.66		0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.18	0.28		0.00	0.04	0.04
s, saturation flow rate [veh/h]	5176	5176		1810	1615	1615
c, Capacity [veh/h]	3393	3393		462	413	413
d1, Uniform Delay [s]	6.53	7.39		25.01	26.09	26.09
k, delay calibration	0.50	0.50		0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	0.39		0.04	0.90	0.90
d3, Initial Queue Delay [s]	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.28	0.42		0.01	0.17	0.17
d, Delay for Lane Group [s/veh]	6.73	7.79		25.05	26.99	26.99
Lane Group LOS	A	A		C	C	C
Critical Lane Group	No	Yes		No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.27	3.93		0.08	1.27	1.27
50th-Percentile Queue Length [ft/ln]	56.71	98.19		2.11	31.79	31.79
95th-Percentile Queue Length [veh/ln]	4.08	7.07		0.15	2.29	2.29
95th-Percentile Queue Length [ft/ln]	102.07	176.74		3.79	57.22	57.22

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	6.73	0.00	0.00	7.79	0.00	0.00	0.00	0.00	25.05	0.00	26.99
Movement LOS		A			A					C		C
d_A, Approach Delay [s/veh]	6.73			7.79			0.00			26.92		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	8.51											
Intersection LOS	A											
Intersection V/C	0.322											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	2.928			2.947			1.425			2.168		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1311			1311			0			0		
d_b, Bicycle Delay [s]	5.34			5.34			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.079			2.351			4.132			4.375		
Bicycle LOS	B			B			D			E		

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Sierra Avenue at SR-210 EB Ramp

Control Type:	Signalized	Delay (sec / veh):	14.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.434

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Base Volume Input [veh/h]	0	905	434	0	1311	331	146	0	432	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0400	1.0000	1.0400	1.0400	1.0400	1.0000	1.0400	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	30	0	0	60	128	88	0	0	0	0	0
Site-Generated Trips [veh/h]	0	17	0	0	3	5	17	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	988	451	0	1426	477	257	0	449	0	0	0
Peak Hour Factor	1.0000	0.9600	0.9500	1.0000	0.9600	0.9500	0.9600	1.0000	0.9600	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	257	119	0	371	126	67	0	117	0	0	0
Total Analysis Volume [veh/h]	0	1029	475	0	1485	502	268	0	468	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	7	0	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	5	0	0	0	0	0
Maximum Green [s]	0	30	0	0	30	0	30	0	0	0	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	58	0	0	58	0	32	0	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	9	0	18	0	0	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall		No			No		No					
Maximum Recall		No			No		No					
Pedestrian Recall		No			No		No					
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	
C, Cycle Length [s]	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	54	54	28	28	28	
g / C, Green / Cycle	0.60	0.60	0.31	0.31	0.31	
(v / s)_i Volume / Saturation Flow Rate	0.20	0.29	0.14	0.15	0.15	
s, saturation flow rate [veh/h]	5176	5176	1810	1621	1615	
c, Capacity [veh/h]	3105	3105	563	504	502	
d1, Uniform Delay [s]	8.99	10.10	24.93	25.04	25.05	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.29	0.53	2.70	3.16	3.18	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.33	0.48	0.46	0.47	0.47	
d, Delay for Lane Group [s/veh]	9.27	10.63	27.63	28.21	28.23	
Lane Group LOS	A	B	C	C	C	
Critical Lane Group	No	Yes	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	3.13	5.09	4.76	4.46	4.45	
50th-Percentile Queue Length [ft/ln]	78.22	127.30	119.08	111.40	111.14	
95th-Percentile Queue Length [veh/ln]	5.63	8.79	8.34	7.92	7.90	
95th-Percentile Queue Length [ft/ln]	140.80	219.82	208.56	197.95	197.58	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	9.27	0.00	0.00	10.63	0.00	27.67	0.00	28.22	0.00	0.00	0.00
Movement LOS		A			B		C		C			
d_A, Approach Delay [s/veh]	9.27			10.63			28.01			0.00		
Approach LOS	A			B			C			A		
d_I, Intersection Delay [s/veh]	14.14											
Intersection LOS	B											
Intersection V/C	0.434											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.011			2.983			2.312			1.425		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1200			1200			0			0		
d_b, Bicycle Delay [s]	7.20			7.20			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.126			2.376			5.347			4.132		
Bicycle LOS	B			B			F			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 58s

SG: 102 15s

SG: 6 58s

SG: 106 14s

SG: 7 32s

SG: 107 23s

Intersection Level Of Service Report
Intersection 4: Sierra Ave / North Dwy

Control Type: Two-way stop
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 17.1
 Level Of Service: C
 Volume to Capacity (v/c): 0.010

Intersection Setup

Name	Sierra Avenue		Sierra Avenue		North Dwy	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		North Dwy	
Base Volume Input [veh/h]	414	0	0	833	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	9	0	2	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	415	9	0	835	3	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	109	2	0	220	1	0
Total Analysis Volume [veh/h]	437	9	0	879	3	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	8.23	0.00	17.10	10.97
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.03	0.03
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.76	0.76
d_A, Approach Delay [s/veh]	0.00		0.00		17.10	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.04					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 5: Sierra Ave / South Dwy

Control Type: Two-way stop
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 20.2
 Level Of Service: C
 Volume to Capacity (v/c): 0.033

Intersection Setup

Name	Sierra Avenue		Sierra Avenue		South Dwy	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		South Dwy	
Base Volume Input [veh/h]	414	0	0	833	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	127	0	0	83	0	0
Site-Generated Trips [veh/h]	10	26	0	5	8	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	568	26	0	954	8	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	149	7	0	251	2	0
Total Analysis Volume [veh/h]	598	27	0	1004	8	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.03	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	8.76	0.00	20.22	12.79
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	2.53	2.53
d_A, Approach Delay [s/veh]	0.00		0.00		20.22	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.10					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 6: Casa Grande Dr / West Dwy

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	West Dwy		Casa Grande Drive		Casa Grande Drive	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	West Dwy		Casa Grande Drive		Casa Grande Drive	
Base Volume Input [veh/h]	0	0	0	72	70	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	148	73	0
Site-Generated Trips [veh/h]	0	6	0	25	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	6	0	248	152	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	0	65	40	0
Total Analysis Volume [veh/h]	0	6	0	261	160	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	9.10	0.00	0.00	0.00	0.00
Movement LOS		A		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.02	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.51	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.10		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.13					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 7: Casa Grande Dr / East Dwy

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	East Dwy		Casa Grande Drive		Casa Grande Drive	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	East Dwy		Casa Grande Drive		Casa Grande Drive	
Base Volume Input [veh/h]	0	0	0	72	70	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0400	1.0400	1.0000
In-Process Volume [veh/h]	0	0	0	148	73	0
Site-Generated Trips [veh/h]	0	2	24	1	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	2	24	224	150	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	1	6	59	39	0
Total Analysis Volume [veh/h]	0	2	25	236	158	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.44	9.07	7.58	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.05	0.05	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.17	0.17	1.34	1.34	0.00	0.00
d_A, Approach Delay [s/veh]	9.07		0.73		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.49					
Intersection LOS	A					

Sierra and Casa Grande Warehouse

Vistro File: K:\...\Casa Grande_TBB_PM.vistro

Scenario 4 OY CUM WP PM

Report File: K:\...\4 OY CUM WP PM.pdf

5/5/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Sierra Avenue at Casa Grande Drive	Signalized	HCM 6th Edition	WB Left	0.621	10.6	B
2	Sierra Avenue at SR-210 WB Ramp	Signalized	HCM 6th Edition	WB Right	0.511	17.6	B
3	Sierra Avenue at SR-210 EB Ramp	Signalized	HCM 6th Edition	EB Right	0.504	15.7	B
4	Sierra Ave / North Dwy	Two-way stop	HCM 6th Edition	WB Left	0.028	16.4	C
5	Sierra Ave / South Dwy	Two-way stop	HCM 6th Edition	WB Left	0.113	20.8	C
6	Casa Grande Dr / West Dwy	Two-way stop	HCM 6th Edition	SB Right	0.022	9.0	A
7	Casa Grande Dr / East Dwy	Two-way stop	HCM 6th Edition	SB Right	0.006	8.9	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Sierra Avenue at Casa Grande Drive

Control Type:	Signalized	Delay (sec / veh):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.621

Intersection Setup

Name	Sierra Avenue			Sierra Avenue						Casa Grande Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			No		

Volumes

Name	Sierra Avenue			Sierra Avenue						Casa Grande Drive		
Base Volume Input [veh/h]	0	717	40	26	461	0	0	0	0	31	0	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
Growth Factor	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	66	76	75	4	104	33	21	21	42	20	33	9
Site-Generated Trips [veh/h]	0	13	8	5	33	0	0	0	0	22	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	835	125	36	616	33	21	21	42	74	33	34
Peak Hour Factor	1.0000	0.9200	0.9200	0.9200	0.9200	1.0000	1.0000	1.0000	1.0000	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	227	34	10	167	8	5	5	11	20	8	9
Total Analysis Volume [veh/h]	66	908	136	39	670	33	21	21	42	80	33	37
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	75	0	0	75	0	0	15	0	0	15	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	9	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	L	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	71	71	71	71	11	11	11	11
g / C, Green / Cycle	0.79	0.79	0.79	0.79	0.12	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.09	0.56	0.07	0.37	0.02	0.04	0.06	0.04
s, saturation flow rate [veh/h]	744	1857	549	1884	1352	1700	1360	1738
c, Capacity [veh/h]	557	1465	352	1487	165	208	170	212
d1, Uniform Delay [s]	6.36	4.58	12.32	3.20	40.12	36.01	41.69	36.13
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.43	2.98	0.64	1.08	1.58	3.73	9.06	4.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.12	0.71	0.11	0.47	0.13	0.30	0.47	0.33
d, Delay for Lane Group [s/veh]	6.80	7.56	12.96	4.28	41.70	39.73	50.75	40.24
Lane Group LOS	A	A	B	A	D	D	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.51	6.92	0.47	3.13	0.51	1.46	2.17	1.63
50th-Percentile Queue Length [ft/ln]	12.71	172.95	11.76	78.26	12.76	36.55	54.17	40.82
95th-Percentile Queue Length [veh/ln]	0.91	11.23	0.85	5.63	0.92	2.63	3.90	2.94
95th-Percentile Queue Length [ft/ln]	22.87	280.79	21.17	140.87	22.97	65.79	97.51	73.47

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.80	7.56	7.56	12.96	4.28	4.28	41.70	39.73	39.73	50.75	40.24	40.24
Movement LOS	A	A	A	B	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	7.51			4.74			40.22			45.84		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.60											
Intersection LOS	B											
Intersection V/C	0.621											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			9.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			36.45			0.00		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.106			0.000		
Crosswalk LOS	F			F			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1578			1578			244			244		
d_b, Bicycle Delay [s]	2.01			2.01			34.67			34.67		
I_b,int, Bicycle LOS Score for Intersection	3.391			2.784			1.698			1.807		
Bicycle LOS	C			C			A			A		

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 75s

SG: 4 15s

SG: 6 75s

SG: 8 15s

SG: 106 14s

Intersection Level Of Service Report

Intersection 2: Sierra Avenue at SR-210 WB Ramp

Control Type:	Signalized	Delay (sec / veh):	17.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.511

Intersection Setup

Name	Sierra Avenue			Sierra Avenue								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue								
Base Volume Input [veh/h]	0	1188	548	0	1141	308	0	0	0	388	0	468
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000	1.0000	1.0000	1.0000	1.0400	1.0000	1.0400
In-Process Volume [veh/h]	0	209	0	0	152	102	0	0	0	0	0	139
Site-Generated Trips [veh/h]	0	13	0	0	33	18	0	0	0	0	0	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1458	548	0	1372	428	0	0	0	404	0	632
Peak Hour Factor	1.0000	0.9700	0.9700	1.0000	0.9700	0.9700	1.0000	1.0000	1.0000	0.9700	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	376	141	0	354	110	0	0	0	104	0	163
Total Analysis Volume [veh/h]	0	1503	565	0	1414	441	0	0	0	416	0	652
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	0	0	3	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	0	0	0	5	0	0
Maximum Green [s]	0	30	0	0	30	0	0	0	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	51	0	0	51	0	0	0	0	39	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	5	0	0
Pedestrian Clearance [s]	0	9	0	0	10	0	0	0	0	18	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No					No		
Maximum Recall		No			No					No		
Pedestrian Recall		No			No					No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C		L	C	R
C, Cycle Length [s]	90	90		90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	47	47		35	35	35
g / C, Green / Cycle	0.52	0.52		0.39	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.29	0.27		0.20	0.22	0.22
s, saturation flow rate [veh/h]	5176	5176		1810	1645	1615
c, Capacity [veh/h]	2703	2703		704	640	628
d1, Uniform Delay [s]	14.48	14.13		20.92	21.45	21.56
k, delay calibration	0.50	0.50		0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.83	0.73		2.59	3.47	3.68
d3, Initial Queue Delay [s]	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.56	0.52		0.51	0.56	0.57
d, Delay for Lane Group [s/veh]	15.31	14.86		23.51	24.92	25.24
Lane Group LOS	B	B		C	C	C
Critical Lane Group	Yes	No		No	No	Yes
50th-Percentile Queue Length [veh/ln]	6.60	6.06		6.00	6.25	6.30
50th-Percentile Queue Length [ft/ln]	165.12	151.45		149.97	156.19	157.55
95th-Percentile Queue Length [veh/ln]	10.82	10.09		10.02	10.35	10.42
95th-Percentile Queue Length [ft/ln]	270.49	252.36		250.39	258.67	260.47

Movement, Approach, & Intersection Results

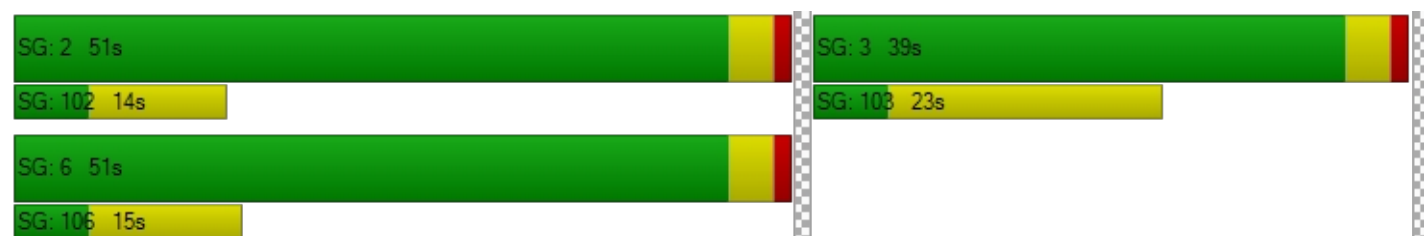
d_M, Delay for Movement [s/veh]	0.00	15.31	0.00	0.00	14.86	0.00	0.00	0.00	0.00	23.71	0.00	25.09
Movement LOS		B			B					C		C
d_A, Approach Delay [s/veh]	15.31			14.86			0.00			24.56		
Approach LOS	B			B			A			C		
d_I, Intersection Delay [s/veh]	17.63											
Intersection LOS	B											
Intersection V/C	0.511											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.060			3.093			1.425			2.393		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1044			1044			0			0		
d_b, Bicycle Delay [s]	10.27			10.27			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.386			2.337			4.132			5.895		
Bicycle LOS	B			B			D			F		

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Sierra Avenue at SR-210 EB Ramp

Control Type:	Signalized	Delay (sec / veh):	15.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.504

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Base Volume Input [veh/h]	0	1433	640	0	1151	399	214	0	476	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000	1.0400	1.0000	1.0400	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	66	0	0	42	110	143	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	0	0	17	16	6	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1563	640	0	1256	525	372	0	495	0	0	0
Peak Hour Factor	1.0000	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	1.0000	0.9500	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	411	168	0	331	138	98	0	130	0	0	0
Total Analysis Volume [veh/h]	0	1645	674	0	1322	553	392	0	521	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	7	0	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	5	0	0	0	0	0
Maximum Green [s]	0	30	0	0	30	0	30	0	0	0	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	56	0	0	56	0	34	0	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	9	0	18	0	0	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall		No			No		No					
Maximum Recall		No			No		No					
Pedestrian Recall		No			No		No					
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	
C, Cycle Length [s]	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	52	52	30	30	30	
g / C, Green / Cycle	0.58	0.58	0.33	0.33	0.33	
(v / s)_i Volume / Saturation Flow Rate	0.32	0.26	0.17	0.18	0.19	
s, saturation flow rate [veh/h]	5176	5176	1810	1664	1615	
c, Capacity [veh/h]	2990	2990	603	555	538	
d1, Uniform Delay [s]	11.76	10.77	24.12	24.45	24.58	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.73	0.48	3.10	3.84	4.14	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.55	0.44	0.51	0.55	0.56	
d, Delay for Lane Group [s/veh]	12.49	11.25	27.22	28.29	28.72	
Lane Group LOS	B	B	C	C	C	
Critical Lane Group	Yes	No	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	6.37	4.67	5.66	5.70	5.71	
50th-Percentile Queue Length [ft/ln]	159.24	116.80	141.55	142.41	142.78	
95th-Percentile Queue Length [veh/ln]	10.51	8.22	9.56	9.61	9.63	
95th-Percentile Queue Length [ft/ln]	262.71	205.42	239.11	240.27	240.77	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	12.49	0.00	0.00	11.25	0.00	27.46	0.00	28.54	0.00	0.00	0.00
Movement LOS		B			B		C		C			
d_A, Approach Delay [s/veh]	12.49			11.25			28.07			0.00		
Approach LOS	B			B			C			A		
d_I, Intersection Delay [s/veh]	15.73											
Intersection LOS	B											
Intersection V/C	0.504											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.081			3.063			2.355			1.425		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1156			1156			0			0		
d_b, Bicycle Delay [s]	8.02			8.02			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.464			2.287			5.639			4.132		
Bicycle LOS	B			B			F			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 56s

SG: 102 15s

SG: 6 56s

SG: 106 14s

SG: 7 34s

SG: 107 23s

Intersection Level Of Service Report
Intersection 4: Sierra Ave / North DwyControl Type: Two-way stop
Analysis Method: HCM 6th Edition
Analysis Period: 15 minutesDelay (sec / veh): 16.4
Level Of Service: C
Volume to Capacity (v/c): 0.028**Intersection Setup**

Name	Sierra Avenue		Sierra Avenue		North Dwy	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		North Dwy	
Base Volume Input [veh/h]	717	0	0	461	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0400	1.0000	1.0000	1.0400	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	3	0	1	9	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	720	3	0	462	9	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	189	1	0	122	2	0
Total Analysis Volume [veh/h]	758	3	0	486	9	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	9.23	0.00	16.35	14.18
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	2.12	2.12
d_A, Approach Delay [s/veh]	0.00		0.00		16.35	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.12					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 5: Sierra Ave / South Dwy

Control Type: Two-way stop
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 20.8
 Level Of Service: C
 Volume to Capacity (v/c): 0.113

Intersection Setup

Name	Sierra Avenue		Sierra Avenue		South Dwy	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		South Dwy	
Base Volume Input [veh/h]	717	0	0	461	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	106	0	0	141	0	0
Site-Generated Trips [veh/h]	6	11	0	10	28	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	858	11	0	630	28	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	226	3	0	166	7	0
Total Analysis Volume [veh/h]	903	12	0	663	29	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.11	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	9.83	0.00	20.78	17.58
Movement LOS	A	A	A	A	C	C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.38	0.38
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	9.41	9.41
d_A, Approach Delay [s/veh]	0.00		0.00		20.78	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.37					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 6: Casa Grande Dr / West Dwy

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.022

Intersection Setup

Name	West Dwy		Casa Grande Drive		Casa Grande Drive	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	West Dwy		Casa Grande Drive		Casa Grande Drive	
Base Volume Input [veh/h]	0	0	0	66	51	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0400	1.0400	1.0400	1.0400	1.0400	1.0400
In-Process Volume [veh/h]	0	0	0	100	62	0
Site-Generated Trips [veh/h]	0	19	0	13	7	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	19	0	182	122	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	5	0	48	32	0
Total Analysis Volume [veh/h]	0	20	0	192	128	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.02	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	8.99	0.00	0.00	0.00	0.00
Movement LOS		A		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.07	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	1.66	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.99		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.53					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 7: Casa Grande Dr / East Dwy

Control Type:	Two-way stop	Delay (sec / veh):	8.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name			Casa Grande Drive		Casa Grande Drive	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name			Casa Grande Drive		Casa Grande Drive	
Base Volume Input [veh/h]	0	0	0	66	51	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0400	1.0400	1.0000
In-Process Volume [veh/h]	0	0	0	100	62	0
Site-Generated Trips [veh/h]	0	6	9	4	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	6	9	173	116	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	2	46	31	0
Total Analysis Volume [veh/h]	0	6	9	182	122	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.42	8.90	7.47	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.02	0.02	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.49	0.49	0.46	0.46	0.00	0.00
d_A, Approach Delay [s/veh]	8.90		0.35		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.38					
Intersection LOS	A					

Sierra and Casa Grande Warehouse

Vistro File: K:\...\Casa Grande_TBB_AM.vistro

Scenario 5 HY AM

Report File: K:\...\5 HY AM.pdf

5/5/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Sierra Avenue at Casa Grande Drive	Signalized	HCM 6th Edition	WB Left	0.622	12.1	B
2	Sierra Avenue at SR-210 WB Ramp	Signalized	HCM 6th Edition	WB Right	0.333	9.0	A
3	Sierra Avenue at SR-210 EB Ramp	Signalized	HCM 6th Edition	EB Right	0.462	13.6	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Sierra Avenue at Casa Grande Drive

Control Type:	Signalized	Delay (sec / veh):	12.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.622

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			Eastbound			Casa Grande Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			No		

Volumes

Name	Sierra Avenue			Sierra Avenue			Eastbound			Casa Grande Drive		
Base Volume Input [veh/h]	30	656	138	67	956	15	30	30	60	81	15	72
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	656	138	67	956	15	30	30	60	81	15	72
Peak Hour Factor	1.0000	0.9200	0.9200	0.9200	0.9200	1.0000	1.0000	1.0000	1.0000	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	178	38	18	260	4	8	8	15	22	4	20
Total Analysis Volume [veh/h]	30	713	150	73	1039	15	30	30	60	88	15	78
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	75	0	0	75	0	0	15	0	0	15	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	9	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	L	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	71	71	71	71	11	11	11	11
g / C, Green / Cycle	0.79	0.79	0.79	0.79	0.12	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.06	0.47	0.11	0.56	0.02	0.05	0.07	0.06
s, saturation flow rate [veh/h]	535	1843	651	1895	1324	1700	1327	1655
c, Capacity [veh/h]	349	1454	458	1495	143	208	148	202
d1, Uniform Delay [s]	11.82	3.77	8.90	4.52	41.75	36.61	43.24	36.74
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.49	1.79	0.74	2.82	3.30	6.46	16.50	7.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.09	0.59	0.16	0.70	0.21	0.43	0.60	0.46
d, Delay for Lane Group [s/veh]	12.30	5.56	9.65	7.34	45.05	43.07	59.74	44.09
Lane Group LOS	B	A	A	A	D	D	E	D
Critical Lane Group	No	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.35	4.61	0.72	6.85	0.77	2.18	2.62	2.29
50th-Percentile Queue Length [ft/ln]	8.77	115.16	17.98	171.34	19.34	54.60	65.57	57.28
95th-Percentile Queue Length [veh/ln]	0.63	8.13	1.29	11.15	1.39	3.93	4.72	4.12
95th-Percentile Queue Length [ft/ln]	15.79	203.16	32.36	278.67	34.81	98.28	118.03	103.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	12.30	5.56	5.56	9.65	7.34	7.34	45.05	43.07	43.07	59.74	44.09	44.09
Movement LOS	B	A	A	A	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	5.79			7.48			43.56			51.70		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	12.14											
Intersection LOS	B											
Intersection V/C	0.622											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			9.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			36.45			0.00		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.043			0.000		
Crosswalk LOS	F			F			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1578			1578			244			244		
d_b, Bicycle Delay [s]	2.01			2.01			34.67			34.67		
I_b,int, Bicycle LOS Score for Intersection	3.033			3.419			1.758			1.858		
Bicycle LOS	C			C			A			A		

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 75s

SG: 4 15s

SG: 6 75s

SG: 8 15s

SG: 106 14s

Intersection Level Of Service Report

Intersection 2: Sierra Avenue at SR-210 WB Ramp

Control Type:	Signalized	Delay (sec / veh):	9.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.333

Intersection Setup

Name	Sierra Avenue			Sierra Avenue								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue								
Base Volume Input [veh/h]	0	884	391	0	1330	380	0	0	0	31	0	171
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	884	391	0	1330	380	0	0	0	31	0	171
Peak Hour Factor	1.0000	0.9300	0.9700	1.0000	0.9300	0.9700	1.0000	1.0000	1.0000	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	238	101	0	358	98	0	0	0	8	0	46
Total Analysis Volume [veh/h]	0	951	403	0	1430	392	0	0	0	33	0	184
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	0	0	3	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	0	0	0	5	0	0
Maximum Green [s]	0	30	0	0	30	0	0	0	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	63	0	0	63	0	0	0	0	27	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	5	0	0
Pedestrian Clearance [s]	0	9	0	0	10	0	0	0	0	18	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No					No		
Maximum Recall		No			No					No		
Pedestrian Recall		No			No					No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C		L	C	R
C, Cycle Length [s]	90	90		90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	59	59		23	23	23
g / C, Green / Cycle	0.66	0.66		0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.18	0.28		0.02	0.06	0.06
s, saturation flow rate [veh/h]	5176	5176		1810	1615	1615
c, Capacity [veh/h]	3393	3393		462	413	413
d1, Uniform Delay [s]	6.54	7.38		25.40	26.45	26.45
k, delay calibration	0.50	0.50		0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	0.39		0.30	1.25	1.25
d3, Initial Queue Delay [s]	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.28	0.42		0.07	0.22	0.22
d, Delay for Lane Group [s/veh]	6.75	7.76		25.70	27.69	27.69
Lane Group LOS	A	A		C	C	C
Critical Lane Group	No	Yes		No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.29	3.89		0.57	1.68	1.68
50th-Percentile Queue Length [ft/ln]	57.22	97.33		14.18	41.93	41.93
95th-Percentile Queue Length [veh/ln]	4.12	7.01		1.02	3.02	3.02
95th-Percentile Queue Length [ft/ln]	103.00	175.20		25.52	75.47	75.47

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	6.75	0.00	0.00	7.76	0.00	0.00	0.00	0.00	25.70	0.00	27.69
Movement LOS		A			A					C		C
d_A, Approach Delay [s/veh]	6.75			7.76			0.00			27.39		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	9.03											
Intersection LOS	A											
Intersection V/C	0.333											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	2.932			2.953			1.425			2.185		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1311			1311			0			0		
d_b, Bicycle Delay [s]	5.34			5.34			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.083			2.346			4.132			4.490		
Bicycle LOS	B			B			D			E		

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Sierra Avenue at SR-210 EB Ramp

Control Type:	Signalized	Delay (sec / veh):	13.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.462

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Base Volume Input [veh/h]	0	1125	451	0	1573	472	240	0	449	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1125	451	0	1573	472	240	0	449	0	0	0
Peak Hour Factor	1.0000	0.9600	0.9500	1.0000	0.9600	0.9500	0.9600	1.0000	0.9600	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	293	119	0	410	124	63	0	117	0	0	0
Total Analysis Volume [veh/h]	0	1172	475	0	1639	497	250	0	468	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	7	0	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	5	0	0	0	0	0
Maximum Green [s]	0	30	0	0	30	0	30	0	0	0	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	60	0	0	60	0	30	0	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	9	0	18	0	0	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall		No			No		No					
Maximum Recall		No			No		No					
Pedestrian Recall		No			No		No					
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	
C, Cycle Length [s]	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	56	56	26	26	26	
g / C, Green / Cycle	0.62	0.62	0.29	0.29	0.29	
(v / s)_i Volume / Saturation Flow Rate	0.23	0.32	0.14	0.14	0.14	
s, saturation flow rate [veh/h]	5176	5176	1810	1615	1615	
c, Capacity [veh/h]	3220	3220	523	467	467	
d1, Uniform Delay [s]	8.30	9.40	26.40	26.61	26.61	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.32	0.58	3.11	3.82	3.82	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.36	0.51	0.48	0.50	0.50	
d, Delay for Lane Group [s/veh]	8.62	9.98	29.52	30.43	30.43	
Lane Group LOS	A	A	C	C	C	
Critical Lane Group	No	Yes	No	Yes	No	
50th-Percentile Queue Length [veh/ln]	3.41	5.42	4.77	4.57	4.57	
50th-Percentile Queue Length [ft/ln]	85.21	135.43	119.31	114.26	114.26	
95th-Percentile Queue Length [veh/ln]	6.14	9.23	8.36	8.08	8.08	
95th-Percentile Queue Length [ft/ln]	153.38	230.86	208.88	201.91	201.91	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	8.62	0.00	0.00	9.98	0.00	29.55	0.00	30.43	0.00	0.00	0.00
Movement LOS		A			A		C		C			
d_A, Approach Delay [s/veh]	8.62			9.98			30.11			0.00		
Approach LOS	A			A			C			A		
d_I, Intersection Delay [s/veh]	13.62											
Intersection LOS	B											
Intersection V/C	0.462											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.052			3.022			2.308			1.425		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1244			1244			0			0		
d_b, Bicycle Delay [s]	6.42			6.42			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.204			2.461			5.317			4.132		
Bicycle LOS	B			B			F			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 60s

SG: 102 15s

SG: 6 60s

SG: 106 14s

SG: 7 30s

SG: 107 23s

Sierra and Casa Grande Warehouse

Vistro File: K:\...\Casa Grande_TBB_PM.vistro

Scenario 5 HY PM

Report File: K:\...\5 HY PM.pdf

5/5/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Sierra Avenue at Casa Grande Drive	Signalized	HCM 6th Edition	WB Left	0.610	10.5	B
2	Sierra Avenue at SR-210 WB Ramp	Signalized	HCM 6th Edition	WB Right	0.507	17.6	B
3	Sierra Avenue at SR-210 EB Ramp	Signalized	HCM 6th Edition	EB Right	0.501	15.8	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Sierra Avenue at Casa Grande Drive

Control Type:	Signalized	Delay (sec / veh):	10.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.610

Intersection Setup

Name	Sierra Avenue			Sierra Avenue						Casa Grande Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			No		

Volumes

Name	Sierra Avenue			Sierra Avenue						Casa Grande Drive		
Base Volume Input [veh/h]	66	844	117	68	725	33	21	21	42	61	33	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	844	117	68	725	33	21	21	42	61	33	42
Peak Hour Factor	1.0000	0.9200	0.9200	0.9200	0.9200	1.0000	1.0000	1.0000	1.0000	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	229	32	18	197	8	5	5	11	17	8	11
Total Analysis Volume [veh/h]	66	917	127	74	788	33	21	21	42	66	33	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	75	0	0	75	0	0	15	0	0	15	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	9	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	L	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	71	71	71	71	11	11	11	11
g / C, Green / Cycle	0.79	0.79	0.79	0.79	0.12	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.10	0.56	0.13	0.44	0.02	0.04	0.05	0.05
s, saturation flow rate [veh/h]	666	1860	549	1887	1341	1700	1360	1723
c, Capacity [veh/h]	482	1467	353	1488	158	208	170	211
d1, Uniform Delay [s]	7.83	4.57	13.18	3.55	40.58	36.01	41.24	36.34
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.59	2.96	1.35	1.48	1.75	3.73	6.56	5.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.14	0.71	0.21	0.55	0.13	0.30	0.39	0.38
d, Delay for Lane Group [s/veh]	8.42	7.53	14.53	5.03	42.33	39.73	47.79	41.38
Lane Group LOS	A	A	B	A	D	D	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.59	6.90	0.96	4.09	0.52	1.46	1.73	1.87
50th-Percentile Queue Length [ft/ln]	14.83	172.53	24.05	102.25	12.94	36.55	43.22	46.83
95th-Percentile Queue Length [veh/ln]	1.07	11.21	1.73	7.36	0.93	2.63	3.11	3.37
95th-Percentile Queue Length [ft/ln]	26.69	280.24	43.29	184.04	23.29	65.79	77.80	84.29

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	8.42	7.53	7.53	14.53	5.03	5.03	42.33	39.73	39.73	47.79	41.38	41.38
Movement LOS	A	A	A	B	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	7.58			5.81			40.38			44.30		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.49											
Intersection LOS	B											
Intersection V/C	0.610											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			9.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			36.45			0.00		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.106			0.000		
Crosswalk LOS	F			F			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1578			1578			244			244		
d_b, Bicycle Delay [s]	2.01			2.01			34.67			34.67		
I_b,int, Bicycle LOS Score for Intersection	3.391			3.036			1.698			1.799		
Bicycle LOS	C			C			A			A		

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 75s

SG: 4 15s

SG: 6 75s

SG: 8 15s

SG: 106 14s

Intersection Level Of Service Report

Intersection 2: Sierra Avenue at SR-210 WB Ramp

Control Type:	Signalized	Delay (sec / veh):	17.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.507

Intersection Setup

Name	Sierra Avenue			Sierra Avenue								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue								
Base Volume Input [veh/h]	0	1445	570	0	1391	422	0	0	0	404	0	626
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1445	570	0	1391	422	0	0	0	404	0	626
Peak Hour Factor	1.0000	0.9700	0.9700	1.0000	0.9700	0.9700	1.0000	1.0000	1.0000	0.9700	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	372	147	0	359	109	0	0	0	104	0	161
Total Analysis Volume [veh/h]	0	1490	588	0	1434	435	0	0	0	416	0	645
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	0	0	3	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	0	0	0	5	0	0
Maximum Green [s]	0	30	0	0	30	0	0	0	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	51	0	0	51	0	0	0	0	39	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	5	0	0
Pedestrian Clearance [s]	0	9	0	0	10	0	0	0	0	18	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No					No		
Maximum Recall		No			No					No		
Pedestrian Recall		No			No					No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C		L	C	R
C, Cycle Length [s]	90	90		90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	47	47		35	35	35
g / C, Green / Cycle	0.52	0.52		0.39	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.29	0.28		0.20	0.21	0.22
s, saturation flow rate [veh/h]	5176	5176		1810	1646	1615
c, Capacity [veh/h]	2703	2703		704	640	628
d1, Uniform Delay [s]	14.43	14.21		20.89	21.40	21.52
k, delay calibration	0.50	0.50		0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.81	0.75		2.56	3.41	3.63
d3, Initial Queue Delay [s]	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.55	0.53		0.50	0.55	0.56
d, Delay for Lane Group [s/veh]	15.24	14.96		23.44	24.82	25.14
Lane Group LOS	B	B		C	C	C
Critical Lane Group	Yes	No		No	No	Yes
50th-Percentile Queue Length [veh/ln]	6.52	6.18		5.95	6.19	6.24
50th-Percentile Queue Length [ft/ln]	163.08	154.46		148.69	154.74	156.12
95th-Percentile Queue Length [veh/ln]	10.71	10.25		9.95	10.27	10.34
95th-Percentile Queue Length [ft/ln]	267.79	256.37		248.68	256.74	258.58

Movement, Approach, & Intersection Results

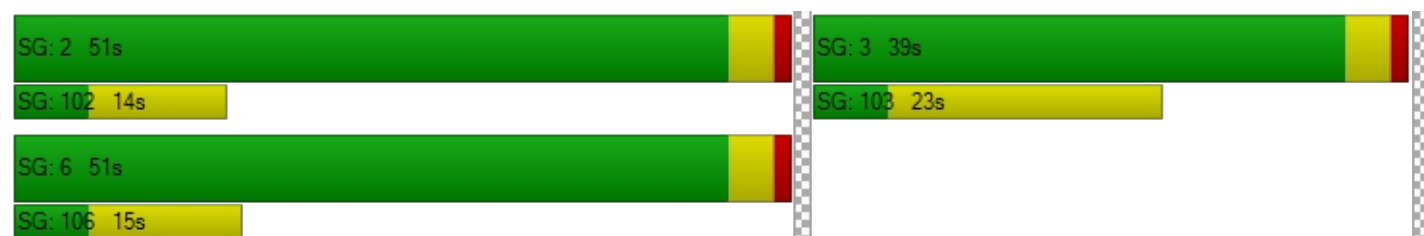
d_M, Delay for Movement [s/veh]	0.00	15.24	0.00	0.00	14.96	0.00	0.00	0.00	0.00	23.65	0.00	25.00
Movement LOS		B			B					C		C
d_A, Approach Delay [s/veh]	15.24			14.96			0.00			24.47		
Approach LOS	B			B			A			C		
d_I, Intersection Delay [s/veh]	17.60											
Intersection LOS	B											
Intersection V/C	0.507											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.061			3.093			1.425			2.391		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1044			1044			0			0		
d_b, Bicycle Delay [s]	10.27			10.27			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.379			2.348			4.132			5.883		
Bicycle LOS	B			B			D			F		

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Sierra Avenue at SR-210 EB Ramp

Control Type:	Signalized	Delay (sec / veh):	15.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.501

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Base Volume Input [veh/h]	0	1556	666	0	1529	525	366	0	495	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1556	666	0	1529	525	366	0	495	0	0	0
Peak Hour Factor	1.0000	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	1.0000	0.9500	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	409	175	0	402	138	96	0	130	0	0	0
Total Analysis Volume [veh/h]	0	1638	701	0	1609	553	385	0	521	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	7	0	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	5	0	0	0	0	0
Maximum Green [s]	0	30	0	0	30	0	30	0	0	0	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	56	0	0	56	0	34	0	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	9	0	18	0	0	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall		No			No		No					
Maximum Recall		No			No		No					
Pedestrian Recall		No			No		No					
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	
C, Cycle Length [s]	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	52	52	30	30	30	
g / C, Green / Cycle	0.58	0.58	0.33	0.33	0.33	
(v / s)_i Volume / Saturation Flow Rate	0.32	0.31	0.17	0.18	0.18	
s, saturation flow rate [veh/h]	5176	5176	1810	1661	1615	
c, Capacity [veh/h]	2990	2990	603	554	538	
d1, Uniform Delay [s]	11.74	11.64	24.10	24.42	24.53	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.73	0.70	3.06	3.79	4.06	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.55	0.54	0.51	0.54	0.55	
d, Delay for Lane Group [s/veh]	12.46	12.34	27.16	28.20	28.59	
Lane Group LOS	B	B	C	C	C	
Critical Lane Group	Yes	No	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	6.33	6.16	5.62	5.64	5.64	
50th-Percentile Queue Length [ft/ln]	158.23	154.10	140.50	140.93	141.12	
95th-Percentile Queue Length [veh/ln]	10.46	10.24	9.51	9.53	9.54	
95th-Percentile Queue Length [ft/ln]	261.38	255.89	237.70	238.27	238.53	

Movement, Approach, & Intersection Results

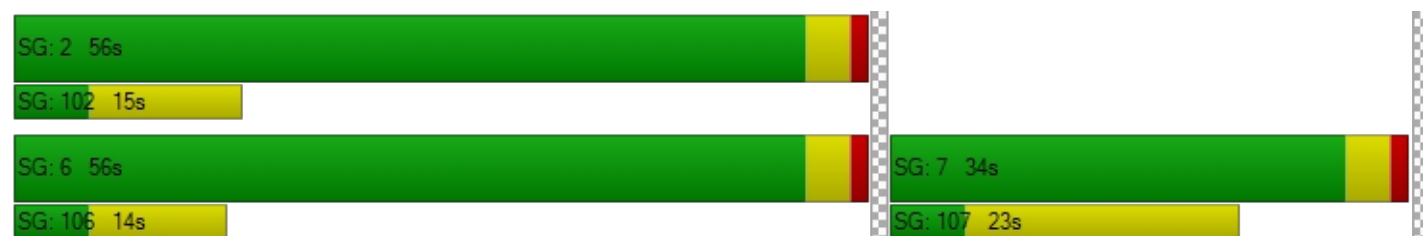
d_M, Delay for Movement [s/veh]	0.00	12.46	0.00	0.00	12.34	0.00	27.38	0.00	28.43	0.00	0.00	0.00
Movement LOS		B			B		C		C			
d_A, Approach Delay [s/veh]	12.46			12.34			27.98			0.00		
Approach LOS	B			B			C			A		
d_I, Intersection Delay [s/veh]	15.80											
Intersection LOS	B											
Intersection V/C	0.501											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.120			3.101			2.353			1.425		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1156			1156			0			0		
d_b, Bicycle Delay [s]	8.02			8.02			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.461			2.445			5.627			4.132		
Bicycle LOS	B			B			F			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Sierra and Casa Grande Warehouse

Vistro File: K:\...\Casa Grande_TBB_AM.vistro

Scenario 6 HY WP AM

Report File: K:\...\6 HY WP AM.pdf

5/5/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Sierra Avenue at Casa Grande Drive	Signalized	HCM 6th Edition	WB Left	0.634	12.7	B
2	Sierra Avenue at SR-210 WB Ramp	Signalized	HCM 6th Edition	WB Right	0.340	9.2	A
3	Sierra Avenue at SR-210 EB Ramp	Signalized	HCM 6th Edition	EB Right	0.465	13.8	B
4	Sierra Ave / North Dwy	Two-way stop	HCM 6th Edition	WB Right	0.013	10.9	B
5	Sierra Ave / South Dwy	Two-way stop	HCM 6th Edition	WB Right	0.008	14.7	B
6	Casa Grande Dr / West Dwy	Two-way stop	HCM 6th Edition	SB Right	0.007	9.2	A
7	Casa Grande Dr / East Dwy	Two-way stop	HCM 6th Edition	SB Right	0.002	9.2	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Sierra Avenue at Casa Grande Drive

Control Type:	Signalized	Delay (sec / veh):	12.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.634

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			Eastbound			Casa Grande Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			No		

Volumes

Name	Sierra Avenue			Sierra Avenue			Eastbound			Casa Grande Drive		
Base Volume Input [veh/h]	30	656	138	67	956	15	30	30	60	81	15	72
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	31	22	3	9	0	0	0	0	7	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	687	160	70	965	15	30	30	60	88	15	77
Peak Hour Factor	1.0000	0.9200	0.9200	0.9200	0.9200	1.0000	1.0000	1.0000	1.0000	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	187	43	19	262	4	8	8	15	24	4	21
Total Analysis Volume [veh/h]	30	747	174	76	1049	15	30	30	60	96	15	84
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	75	0	0	75	0	0	15	0	0	15	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	9	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	L	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	71	71	71	71	11	11	11	11
g / C, Green / Cycle	0.79	0.79	0.79	0.79	0.12	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.06	0.50	0.12	0.56	0.02	0.05	0.07	0.06
s, saturation flow rate [veh/h]	530	1839	616	1895	1317	1700	1327	1653
c, Capacity [veh/h]	343	1451	422	1495	138	208	148	202
d1, Uniform Delay [s]	12.09	4.02	10.17	4.57	42.08	36.61	43.39	36.88
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.50	2.13	0.93	2.91	3.59	6.46	20.11	8.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.09	0.63	0.18	0.71	0.22	0.43	0.65	0.49
d, Delay for Lane Group [s/veh]	12.60	6.15	11.11	7.48	45.67	43.07	63.50	45.15
Lane Group LOS	B	A	B	A	D	D	E	D
Critical Lane Group	No	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.36	5.28	0.82	7.01	0.78	2.18	2.95	2.47
50th-Percentile Queue Length [ft/ln]	8.91	131.89	20.61	175.33	19.56	54.60	73.69	61.78
95th-Percentile Queue Length [veh/ln]	0.64	9.04	1.48	11.36	1.41	3.93	5.31	4.45
95th-Percentile Queue Length [ft/ln]	16.04	226.06	37.10	283.91	35.22	98.28	132.65	111.20

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	12.60	6.15	6.15	11.11	7.48	7.48	45.67	43.07	43.07	63.50	45.15	45.15
Movement LOS	B	A	A	B	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	6.35			7.72			43.72			54.18		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	12.74											
Intersection LOS	B											
Intersection V/C	0.634											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			9.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			36.45			0.00		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.043			0.000		
Crosswalk LOS	F			F			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1578			1578			244			244		
d_b, Bicycle Delay [s]	2.01			2.01			34.67			34.67		
I_b,int, Bicycle LOS Score for Intersection	3.129			3.441			1.758			1.881		
Bicycle LOS	C			C			A			A		

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 2: Sierra Avenue at SR-210 WB Ramp

Control Type:	Signalized	Delay (sec / veh):	9.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.340

Intersection Setup

Name	Sierra Avenue			Sierra Avenue								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue								
Base Volume Input [veh/h]	0	884	391	0	1330	380	0	0	0	31	0	171
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	34	0	0	10	5	0	0	0	0	0	15
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	918	391	0	1340	385	0	0	0	31	0	186
Peak Hour Factor	1.0000	0.9300	0.9700	1.0000	0.9300	0.9700	1.0000	1.0000	1.0000	0.9300	1.0000	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	247	101	0	360	99	0	0	0	8	0	50
Total Analysis Volume [veh/h]	0	987	403	0	1441	397	0	0	0	33	0	200
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	0	0	3	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	0	0	0	5	0	0
Maximum Green [s]	0	30	0	0	30	0	0	0	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	63	0	0	63	0	0	0	0	27	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	5	0	0
Pedestrian Clearance [s]	0	9	0	0	10	0	0	0	0	18	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No					No		
Maximum Recall		No			No					No		
Pedestrian Recall		No			No					No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C		L	C	R
C, Cycle Length [s]	90	90		90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	59	59		23	23	23
g / C, Green / Cycle	0.66	0.66		0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.19	0.28		0.02	0.06	0.06
s, saturation flow rate [veh/h]	5176	5176		1810	1615	1615
c, Capacity [veh/h]	3393	3393		462	413	413
d1, Uniform Delay [s]	6.60	7.40		25.40	26.59	26.59
k, delay calibration	0.50	0.50		0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.22	0.39		0.30	1.39	1.39
d3, Initial Queue Delay [s]	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.42		0.07	0.24	0.24
d, Delay for Lane Group [s/veh]	6.81	7.79		25.70	27.97	27.97
Lane Group LOS	A	A		C	C	C
Critical Lane Group	No	Yes		No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.40	3.94		0.57	1.84	1.84
50th-Percentile Queue Length [ft/ln]	59.91	98.38		14.18	45.89	45.89
95th-Percentile Queue Length [veh/ln]	4.31	7.08		1.02	3.30	3.30
95th-Percentile Queue Length [ft/ln]	107.84	177.08		25.52	82.61	82.61

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	6.81	0.00	0.00	7.79	0.00	0.00	0.00	0.00	25.70	0.00	27.97
Movement LOS		A			A					C		C
d_A, Approach Delay [s/veh]	6.81			7.79			0.00			27.65		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	9.17											
Intersection LOS	A											
Intersection V/C	0.340											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	2.938			2.961			1.425			2.189		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1311			1311			0			0		
d_b, Bicycle Delay [s]	5.34			5.34			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.102			2.352			4.132			4.517		
Bicycle LOS	B			B			D			E		

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Sierra Avenue at SR-210 EB Ramp

Control Type:	Signalized	Delay (sec / veh):	13.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.465

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Base Volume Input [veh/h]	0	1125	451	0	1573	472	240	0	449	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	17	0	0	3	7	17	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1142	451	0	1576	479	257	0	449	0	0	0
Peak Hour Factor	1.0000	0.9600	0.9500	1.0000	0.9600	0.9500	0.9600	1.0000	0.9600	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	297	119	0	410	126	67	0	117	0	0	0
Total Analysis Volume [veh/h]	0	1190	475	0	1642	504	268	0	468	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	7	0	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	5	0	0	0	0	0
Maximum Green [s]	0	30	0	0	30	0	30	0	0	0	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	60	0	0	60	0	30	0	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	9	0	18	0	0	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall		No			No		No					
Maximum Recall		No			No		No					
Pedestrian Recall		No			No		No					
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	
C, Cycle Length [s]	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	56	56	26	26	26	
g / C, Green / Cycle	0.62	0.62	0.29	0.29	0.29	
(v / s)_i Volume / Saturation Flow Rate	0.23	0.32	0.14	0.15	0.15	
s, saturation flow rate [veh/h]	5176	5176	1810	1621	1615	
c, Capacity [veh/h]	3220	3220	523	468	467	
d1, Uniform Delay [s]	8.34	9.41	26.56	26.68	26.69	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.33	0.58	3.34	3.92	3.95	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.37	0.51	0.50	0.51	0.51	
d, Delay for Lane Group [s/veh]	8.67	9.99	29.90	30.61	30.63	
Lane Group LOS	A	A	C	C	C	
Critical Lane Group	No	Yes	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	3.48	5.43	4.99	4.68	4.67	
50th-Percentile Queue Length [ft/ln]	86.92	135.80	124.85	116.97	116.70	
95th-Percentile Queue Length [veh/ln]	6.26	9.25	8.66	8.23	8.21	
95th-Percentile Queue Length [ft/ln]	156.45	231.36	216.48	205.66	205.28	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	8.67	0.00	0.00	9.99	0.00	29.96	0.00	30.62	0.00	0.00	0.00
Movement LOS		A			A		C		C			
d_A, Approach Delay [s/veh]	8.67			9.99			30.37			0.00		
Approach LOS	A			A			C			A		
d_I, Intersection Delay [s/veh]	13.75											
Intersection LOS	B											
Intersection V/C	0.465											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.055			3.027			2.312			1.425		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1244			1244			0			0		
d_b, Bicycle Delay [s]	6.42			6.42			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.214			2.463			5.347			4.132		
Bicycle LOS	B			B			F			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Sierra Ave / North Dwy

Control Type: Two-way stop
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 10.9
 Level Of Service: B
 Volume to Capacity (v/c): 0.013

Intersection Setup

Name	Sierra Avenue		Sierra Avenue		North Dwy	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		North Dwy	
Base Volume Input [veh/h]	414	0	0	833	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	9	0	12	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	418	9	0	845	0	8
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	110	2	0	222	0	2
Total Analysis Volume [veh/h]	440	9	0	889	0	8
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.01	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	10.95
Movement LOS	A	A		A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.04
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.99
d_A, Approach Delay [s/veh]	0.00		0.00		10.95	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.07					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: Sierra Ave / South Dwy

Control Type: Two-way stop
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 14.7
 Level Of Service: B
 Volume to Capacity (v/c): 0.008

Intersection Setup

Name	Sierra Avenue		Sierra Avenue		South Dwy	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		South Dwy	
Base Volume Input [veh/h]	758	0	0	1038	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	26	0	12	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	768	26	0	1050	0	3
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	202	7	0	276	0	1
Total Analysis Volume [veh/h]	808	27	0	1105	0	3
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	14.70
Movement LOS	A	A		A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.02
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.61
d_A, Approach Delay [s/veh]	0.00		0.00		14.70	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.02					
Intersection LOS	B					

Intersection Level Of Service Report

Intersection 6: Casa Grande Dr / West Dwy

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	West Dwy		Casa Grande Drive		Casa Grande Drive	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	West Dwy		Casa Grande Drive		Casa Grande Drive	
Base Volume Input [veh/h]	0	0	0	235	168	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	25	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	6	0	260	174	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	0	68	46	0
Total Analysis Volume [veh/h]	0	6	0	274	183	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	9.22	0.00	0.00	0.00	0.00
Movement LOS		A		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.02	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.53	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.22		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.12					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 7: Casa Grande Dr / East Dwy

Control Type: Two-way stop
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 9.2
 Level Of Service: A
 Volume to Capacity (v/c): 0.002

Intersection Setup

Name	East Dwy		Casa Grande Drive		Casa Grande Drive	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	East Dwy		Casa Grande Drive		Casa Grande Drive	
Base Volume Input [veh/h]	0	0	0	235	168	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	2	24	1	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	2	24	236	172	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	1	6	62	45	0
Total Analysis Volume [veh/h]	0	2	25	248	181	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.75	9.19	7.63	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.05	0.05	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.17	0.17	1.37	1.37	0.00	0.00
d_A, Approach Delay [s/veh]	9.19		0.70		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.46					
Intersection LOS	A					

Sierra and Casa Grande Warehouse

Vistro File: K:\...\Casa Grande_TBB_PM.vistro

Scenario 6 HY WP PM

Report File: K:\...\6 HY WP PM.pdf

5/5/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Sierra Avenue at Casa Grande Drive	Signalized	HCM 6th Edition	WB Left	0.641	11.4	B
2	Sierra Avenue at SR-210 WB Ramp	Signalized	HCM 6th Edition	WB Right	0.511	17.7	B
3	Sierra Avenue at SR-210 EB Ramp	Signalized	HCM 6th Edition	EB Right	0.504	15.9	B
4	Sierra Ave / North Dwy	Two-way stop	HCM 6th Edition	WB Right	0.072	14.7	B
5	Sierra Ave / South Dwy	Two-way stop	HCM 6th Edition	WB Right	0.029	17.0	C
6	Casa Grande Dr / West Dwy	Two-way stop	HCM 6th Edition	SB Right	0.022	9.1	A
7	Casa Grande Dr / East Dwy	Two-way stop	HCM 6th Edition	SB Right	0.007	9.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report

Intersection 1: Sierra Avenue at Casa Grande Drive

Control Type:	Signalized	Delay (sec / veh):	11.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.641

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			Eastbound			Casa Grande Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			No		

Volumes

Name	Sierra Avenue			Sierra Avenue			Eastbound			Casa Grande Drive		
Base Volume Input [veh/h]	66	844	117	68	725	33	21	21	42	61	33	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	13	8	5	33	0	0	0	0	22	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	857	125	73	758	33	21	21	42	83	33	46
Peak Hour Factor	1.0000	0.9200	0.9200	0.9200	0.9200	1.0000	1.0000	1.0000	1.0000	0.9200	1.0000	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	233	34	20	206	8	5	5	11	23	8	13
Total Analysis Volume [veh/h]	66	932	136	79	824	33	21	21	42	90	33	50
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	75	0	0	75	0	0	15	0	0	15	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	9	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	L	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	71	71	71	71	11	11	11	11
g / C, Green / Cycle	0.79	0.79	0.79	0.79	0.12	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.10	0.57	0.15	0.45	0.02	0.04	0.07	0.05
s, saturation flow rate [veh/h]	644	1858	537	1887	1336	1700	1360	1717
c, Capacity [veh/h]	461	1466	338	1489	154	208	170	210
d1, Uniform Delay [s]	8.39	4.72	14.19	3.67	40.79	36.01	42.02	36.43
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.65	3.21	1.61	1.63	1.84	3.73	11.29	5.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.14	0.73	0.23	0.58	0.14	0.30	0.53	0.40
d, Delay for Lane Group [s/veh]	9.04	7.93	15.81	5.30	42.63	39.73	53.31	41.93
Lane Group LOS	A	A	B	A	D	D	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.62	7.32	1.09	4.43	0.52	1.46	2.51	1.98
50th-Percentile Queue Length [ft/ln]	15.58	182.97	27.14	110.76	13.02	36.55	62.64	49.57
95th-Percentile Queue Length [veh/ln]	1.12	11.76	1.95	7.88	0.94	2.63	4.51	3.57
95th-Percentile Queue Length [ft/ln]	28.04	293.89	48.85	197.06	23.44	65.79	112.74	89.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.04	7.93	7.93	15.81	5.30	5.30	42.63	39.73	39.73	53.31	41.93	41.93
Movement LOS	A	A	A	B	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	7.99			6.19			40.46			47.85		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	11.40											
Intersection LOS	B											
Intersection V/C	0.641											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			9.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			36.45			0.00		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.106			0.000		
Crosswalk LOS	F			F			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1578			1578			244			244		
d_b, Bicycle Delay [s]	2.01			2.01			34.67			34.67		
I_b,int, Bicycle LOS Score for Intersection	3.431			3.104			1.698			1.845		
Bicycle LOS	C			C			A			A		

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 75s

SG: 4 15s

SG: 6 75s

SG: 8 15s

SG: 106 14s

Intersection Level Of Service Report

Intersection 2: Sierra Avenue at SR-210 WB Ramp

Control Type:	Signalized	Delay (sec / veh):	17.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.511

Intersection Setup

Name	Sierra Avenue			Sierra Avenue								
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue								
Base Volume Input [veh/h]	0	1445	570	0	1391	422	0	0	0	404	0	626
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	13	0	0	38	14	0	0	0	0	0	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1458	570	0	1429	436	0	0	0	404	0	632
Peak Hour Factor	1.0000	0.9700	0.9700	1.0000	0.9700	0.9700	1.0000	1.0000	1.0000	0.9700	1.0000	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	376	147	0	368	112	0	0	0	104	0	163
Total Analysis Volume [veh/h]	0	1503	588	0	1473	449	0	0	0	416	0	652
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	0	0	0	3	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	0	0	0	5	0	0
Maximum Green [s]	0	30	0	0	30	0	0	0	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	51	0	0	51	0	0	0	0	39	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	0	0	0	5	0	0
Pedestrian Clearance [s]	0	9	0	0	10	0	0	0	0	18	0	0
Rest In Walk		No			No					No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No					No		
Maximum Recall		No			No					No		
Pedestrian Recall		No			No					No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C		L	C	R
C, Cycle Length [s]	90	90		90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	47	47		35	35	35
g / C, Green / Cycle	0.52	0.52		0.39	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.29	0.28		0.20	0.22	0.22
s, saturation flow rate [veh/h]	5176	5176		1810	1645	1615
c, Capacity [veh/h]	2703	2703		704	640	628
d1, Uniform Delay [s]	14.48	14.36		20.92	21.45	21.56
k, delay calibration	0.50	0.50		0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	0.83	0.79		2.59	3.47	3.68
d3, Initial Queue Delay [s]	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00		1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.56	0.54		0.51	0.56	0.57
d, Delay for Lane Group [s/veh]	15.31	15.15		23.51	24.92	25.24
Lane Group LOS	B	B		C	C	C
Critical Lane Group	Yes	No		No	No	Yes
50th-Percentile Queue Length [veh/ln]	6.60	6.42		6.00	6.25	6.30
50th-Percentile Queue Length [ft/ln]	165.12	160.43		149.97	156.19	157.55
95th-Percentile Queue Length [veh/ln]	10.82	10.57		10.02	10.35	10.42
95th-Percentile Queue Length [ft/ln]	270.49	264.29		250.39	258.67	260.47

Movement, Approach, & Intersection Results

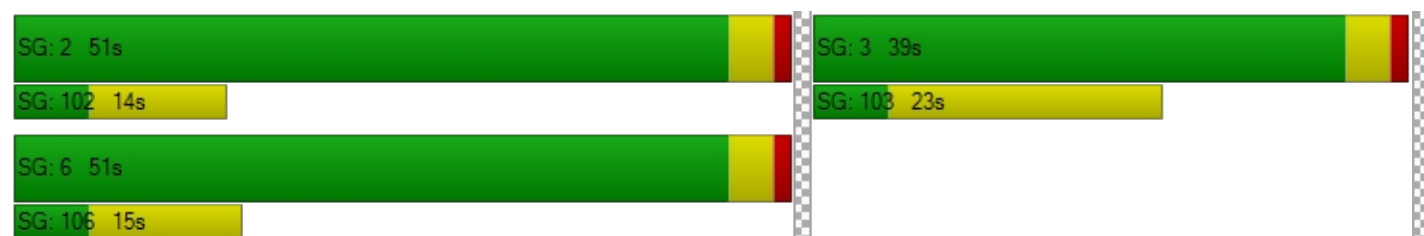
d_M, Delay for Movement [s/veh]	0.00	15.31	0.00	0.00	15.15	0.00	0.00	0.00	0.00	23.71	0.00	25.09
Movement LOS		B			B					C		C
d_A, Approach Delay [s/veh]	15.31			15.15			0.00			24.56		
Approach LOS	B			B			A			C		
d_I, Intersection Delay [s/veh]	17.69											
Intersection LOS	B											
Intersection V/C	0.511											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.068			3.101			1.425			2.393		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1044			1044			0			0		
d_b, Bicycle Delay [s]	10.27			10.27			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.386			2.370			4.132			5.895		
Bicycle LOS	B			B			D			F		

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Sierra Avenue at SR-210 EB Ramp

Control Type:	Signalized	Delay (sec / veh):	15.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.504

Intersection Setup

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Sierra Avenue			Sierra Avenue			SR-210 EB Ramp					
Base Volume Input [veh/h]	0	1556	666	0	1529	525	366	0	495	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	0	0	17	21	6	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1563	666	0	1546	546	372	0	495	0	0	0
Peak Hour Factor	1.0000	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	1.0000	0.9500	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	411	175	0	407	144	98	0	130	0	0	0
Total Analysis Volume [veh/h]	0	1645	701	0	1627	575	392	0	521	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	6	0	7	0	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	5	0	0	0	0	0
Maximum Green [s]	0	30	0	0	30	0	30	0	0	0	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	56	0	0	56	0	34	0	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	9	0	18	0	0	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall		No			No		No					
Maximum Recall		No			No		No					
Pedestrian Recall		No			No		No					
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	
C, Cycle Length [s]	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	52	52	30	30	30	
g / C, Green / Cycle	0.58	0.58	0.33	0.33	0.33	
(v / s)_i Volume / Saturation Flow Rate	0.32	0.31	0.17	0.18	0.19	
s, saturation flow rate [veh/h]	5176	5176	1810	1664	1615	
c, Capacity [veh/h]	2990	2990	603	555	538	
d1, Uniform Delay [s]	11.76	11.70	24.12	24.45	24.58	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.73	0.72	3.10	3.84	4.14	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.55	0.54	0.51	0.55	0.56	
d, Delay for Lane Group [s/veh]	12.49	12.42	27.22	28.29	28.72	
Lane Group LOS	B	B	C	C	C	
Critical Lane Group	Yes	No	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	6.37	6.27	5.66	5.70	5.71	
50th-Percentile Queue Length [ft/ln]	159.24	156.65	141.55	142.41	142.78	
95th-Percentile Queue Length [veh/ln]	10.51	10.37	9.56	9.61	9.63	
95th-Percentile Queue Length [ft/ln]	262.71	259.29	239.11	240.27	240.77	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	12.49	0.00	0.00	12.42	0.00	27.46	0.00	28.54	0.00	0.00	0.00
Movement LOS		B			B		C		C			
d_A, Approach Delay [s/veh]	12.49			12.42			28.07			0.00		
Approach LOS	B			B			C			A		
d_I, Intersection Delay [s/veh]	15.86											
Intersection LOS	B											
Intersection V/C	0.504											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	3.124			3.106			2.355			1.425		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1156			1156			0			0		
d_b, Bicycle Delay [s]	8.02			8.02			45.00			45.00		
I_b,int, Bicycle LOS Score for Intersection	2.464			2.454			5.639			4.132		
Bicycle LOS	B			B			F			D		

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 56s

SG: 102 15s

SG: 6 56s

SG: 106 14s

SG: 7 34s

SG: 107 23s

Intersection Level Of Service Report
Intersection 4: Sierra Ave / North Dwy

Control Type: Two-way stop
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 14.7
 Level Of Service: B
 Volume to Capacity (v/c): 0.072

Intersection Setup

Name	Sierra Avenue		Sierra Avenue		North Dwy	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		North Dwy	
Base Volume Input [veh/h]	717	0	0	461	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	3	0	38	0	28
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	729	3	0	499	0	28
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	192	1	0	131	0	7
Total Analysis Volume [veh/h]	767	3	0	525	0	29
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.00	0.07
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	14.67
Movement LOS	A	A		A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.23
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	5.81
d_A, Approach Delay [s/veh]	0.00		0.00		14.67	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.32					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: Sierra Ave / South Dwy

Control Type: Two-way stop
 Analysis Method: HCM 6th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 17.0
 Level Of Service: C
 Volume to Capacity (v/c): 0.029

Intersection Setup

Name	Sierra Avenue		Sierra Avenue		South Dwy	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Sierra Avenue		Sierra Avenue		South Dwy	
Base Volume Input [veh/h]	907	0	0	826	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	6	11	0	38	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	913	11	0	864	0	9
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	240	3	0	227	0	2
Total Analysis Volume [veh/h]	961	12	0	909	0	9
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.00	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	17.02
Movement LOS	A	A		A		C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.09
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	2.25
d_A, Approach Delay [s/veh]	0.00		0.00		17.02	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.08					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 6: Casa Grande Dr / West Dwy

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.022

Intersection Setup

Name	West Dwy		Casa Grande Drive		Casa Grande Drive	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	West Dwy		Casa Grande Drive		Casa Grande Drive	
Base Volume Input [veh/h]	0	0	0	204	136	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	13	7	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	19	0	217	143	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	5	0	57	38	0
Total Analysis Volume [veh/h]	0	20	0	228	151	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.02	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	9.11	0.00	0.00	0.00	0.00
Movement LOS		A		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.07	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	1.71	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.11		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.46					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 7: Casa Grande Dr / East Dwy

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name			Casa Grande Drive		Casa Grande Drive	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name			Casa Grande Drive		Casa Grande Drive	
Base Volume Input [veh/h]	0	0	0	204	136	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	9	4	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	6	9	208	137	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	2	55	36	0
Total Analysis Volume [veh/h]	0	6	9	219	144	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.86	9.01	7.52	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.02	0.02	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.50	0.50	0.47	0.47	0.00	0.00
d_A, Approach Delay [s/veh]	9.01		0.30		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.32					
Intersection LOS	A					

APPENDIX **D**
CUMULATIVE PROJECTS INFORMATION

TOTAL CUMULATIVE PROJECTS TRAFFIC

		AM Peak Hour											
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Sierra Avenue at Casa Grande Drive	30	94	109	9	59	15	30	30	60	55	15	3
2	Sierra Avenue at SR-210 Westbound Ramp	0	118	0	0	187	125	0	0	0	0	0	79
3	Sierra Avenue at SR-210 Eastbound Ramp	0	30	0	0	60	128	88	0	0	0	0	0

PM Peak Hour													
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Sierra Avenue at Casa Grande Drive	66	76	75	4	104	33	21	21	42	20	33	9
2	Sierra Avenue at SR-210 Westbound Ramp	0	209	0	0	152	102	0	0	0	0	0	139
3	Sierra Avenue at SR-210 Eastbound Ramp	0	66	0	0	42	110	143	0	0	0	0	0

Enter only in blue cells Yellow cells calculate

Int. #: 1 Sierra Avenue at Casa Grande Drive

Mirror distribution? Y Entire Intersection

Mirror distribution?

Zone # 1 Summit at Rosena

Pk Hr	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In	10%			15%	5%					15%	5%	
Y	0%	15%	15%	0%	0%	0%	5%	5%	10%	0%	0%	0%
AM Out												
PM In	10%	0%	0%	0%	15%	5%	0%	0%	0%		5%	0%
PM Out	0%	15%	15%	0%	0%	0%	5%	5%	10%	0%	0%	0%

Zone # 2 SEC Sierra / Clubhouse Dr - Warehouse

Pk Hr	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In			20%	10%	15%					5%		
Y	0%	15%	5%	0%	0%	0%	0%	0%	0%	20%	0%	10%
AM Out												
PM In	0%	0%	20%	10%	15%	0%	0%	0%	0%	5%	0%	0%
PM Out	0%	15%	5%	0%	0%	0%	0%	0%	0%	20%	0%	10%

Zone # 3 0

Pk Hr	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In												
Y	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
AM Out												
PM In	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PM Out	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Zone # 4 0

Pk Hr	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In												
Y	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
AM Out												
PM In	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PM Out	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

TOTAL CUMULATIVE PROJECTS TRAFFIC													
Pk Hr		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In		30	0	18	9	59	15	0	0	0	50	15	0
AM Out		0	94	91	0	0	0	30	30	60	5	0	3
AM Tot		30	94	109	9	59	15	30	30	60	55	15	3
PM In		66	0	8	4	104	33	0	0	0	2	33	0
PM Out		0	76	67	0	0	0	21	21	42	18	0	9
PM Tot		66	76	75	4	104	33	21	21	42	20	33	9

Pk Hr	T Gen	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In	303	30	0	0	0	45	15	0	0	0	45	15	0
AM Out	598	0	90	90	0	0	0	30	30	60	0	0	0
PM In	656	66	0	0	0	98	33	0	0	0	0	33	0
PM Out	420	0	63	63	0	0	0	21	21	42	0	0	0

Pk Hr	T Gen	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In	91	0	0	18	9	14	0	0	0	0	5	0	0
AM Out	27	0	4	1	0	0	0	0	0	0	5	0	3
PM In	40	0	0	8	4	6	0	0	0	0	2	0	0
PM Out	88	0	13	4	0	0	0	0	0	0	18	0	9

Pk Hr	T Gen	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In	0	0	0	0	0	0	0	0	0	0	0	0	0
AM Out	0	0	0	0	0	0	0	0	0	0	0	0	0
PM In	0	0	0	0	0	0	0	0	0	0	0	0	0
PM Out	0	0	0	0	0	0	0	0	0	0	0	0	0

Pk Hr	T Gen	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In	0	0	0	0	0	0	0	0	0	0	0	0	0
AM Out	0	0	0	0	0	0	0	0	0	0	0	0	0
PM In	0	0	0	0	0	0	0	0	0	0	0	0	0
PM Out	0	0	0	0	0	0	0	0	0	0	0	0	0

Enter only in blue cells Yellow cells calculate

Int. #: 2 Sierra Avenue at SR-210 Westbound Ramp

N

Zone # 1 Summit at Rosena

Pk Hr	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In		30%										20%
N	0%	0%	0%	0%	30%	20%	0%	0%	0%	0%	0%	0%
AM Out					30%	20%						
PM In	0%	30%	0%	0%	0%	0%	0%	0%	0%		0%	20%
PM Out	0%	0%	0%	0%	30%	20%	0%	0%	0%	0%	0%	0%

Zone # 2 SEC Sierra / Clubhouse Dr - Warehouse

Pk Hr	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In		30%										20%
N	0%	0%	0%	0%	30%	20%	0%	0%	0%	0%	0%	0%
AM Out					30%	20%						
PM In	0%	30%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%
PM Out	0%	0%	0%	0%	30%	20%	0%	0%	0%	0%	0%	0%

Zone # 3 0

Pk Hr	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In												
N	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
AM Out												
PM In	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PM Out	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Zone # 4 0

Pk Hr	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In												
N	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
AM Out												
PM In	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PM Out	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

TOTAL CUMULATIVE PROJECTS TRAFFIC													
Pk Hr		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In		0	118	0	0	0	0	0	0	0	0	0	79
AM Out		0	0	0	0	187	125	0	0	0	0	0	0
AM Tot		0	118	0	0	187	125	0	0	0	0	0	79
PM In		0	209	0	0	0	0	0	0	0	0	0	139
PM Out		0	0	0	0	152	102	0	0	0	0	0	0
PM Tot		0	209	0	0	152	102	0	0	0	0	0	139

Pk Hr	T Gen	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In	303	0	91	0	0	0	0	0	0	0	0	0	61
AM Out	598	0	0	0	0	179	120	0	0	0	0	0	0
PM In	656	0	197	0	0	0	0	0	0	0	0	0	131
PM Out	420	0	0	0	0	126	84	0	0	0	0	0	0

Pk Hr	T Gen	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In	91	0	27	0	0	0	0	0	0	0	0	0	18
AM Out	27	0	0	0	0	8	5	0	0	0	0	0	0
PM In	40	0	12	0	0	0	0	0	0	0	0	0	8
PM Out	88	0	0	0	0	26	18	0	0	0	0	0	0

Pk Hr	T Gen	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In	0	0	0	0	0	0	0	0	0	0	0	0	0
AM Out	0	0	0	0	0	0	0	0	0	0	0	0	0
PM In	0	0	0	0	0	0	0	0	0	0	0	0	0
PM Out	0	0	0	0	0	0	0	0	0	0	0	0	0

Pk Hr	T Gen	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In	0	0	0	0	0	0	0	0	0	0	0	0	0
AM Out	0	0	0	0	0	0	0	0	0	0	0	0	0
PM In	0	0	0	0	0	0	0	0	0	0	0	0	0
PM Out	0	0	0	0	0	0	0	0	0	0	0	0	0

Int. #: 3 Sierra Avenue at SR-210 Eastbound Ramp

N

TOTAL CUMULATIVE PROJECTS TRAFFIC													
Pk Hr		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In		0	30	0	0	0	0	88	0	0	0	0	0
AM Out		0	0	0	0	60	128	0	0	0	0	0	0
AM Tot		0	30	0	0	60	128	88	0	0	0	0	0
PM In		0	66	0	0	0	0	143	0	0	0	0	0
PM Out		0	0	0	0	42	110	0	0	0	0	0	0
PM Tot		0	66	0	0	42	110	143	0	0	0	0	0

Zone # 1 Summit at Rosena

Pk Hr	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In		10%				20%						
N	0%	0%	0%	0%	10%	20%	0%	0%	0%	0%	0%	0%
AM Out					10%	20%						
PM In	0%	10%	0%	0%	0%	20%	0%	0%		0%	0%	0%
PM Out	0%	0%	0%	0%	10%	20%	0%	0%	0%	0%	0%	0%

Pk Hr	T Gen	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In	303	0	30	0	0	0	0	61	0	0	0	0	0
AM Out	598	0	0	0	0	60	120	0	0	0	0	0	0
PM In	656	0	66	0	0	0	0	131	0	0	0	0	0
PM Out	420	0	0	0	0	42	84	0	0	0	0	0	0

Zone # 2 SEC Sierra / Clubhouse Dr - Warehouse

Pk Hr	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In							30%					
N	0%	0%	0%	0%	0%	30%	0%	0%	0%	0%	0%	0%
AM Out						30%						
PM In	0%	0%	0%	0%	0%	0%	30%	0%	0%	0%	0%	0%
PM Out	0%	0%	0%	0%	0%	30%	0%	0%	0%	0%	0%	0%

Pk Hr	T Gen	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In	91	0	0	0	0	0	0	27	0	0	0	0	0
AM Out	27	0	0	0	0	0	8	0	0	0	0	0	0
PM In	40	0	0	0	0	0	0	12	0	0	0	0	0
PM Out	88	0	0	0	0	0	26	0	0	0	0	0	0

Zone # 3 0

Pk Hr	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In												
N	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
AM Out												
PM In	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PM Out	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Pk Hr	T Gen	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In	0	0	0	0	0	0	0	0	0	0	0	0	0
AM Out	0	0	0	0	0	0	0	0	0	0	0	0	0
PM In	0	0	0	0	0	0	0	0	0	0	0	0	0
PM Out	0	0	0	0	0	0	0	0	0	0	0	0	0

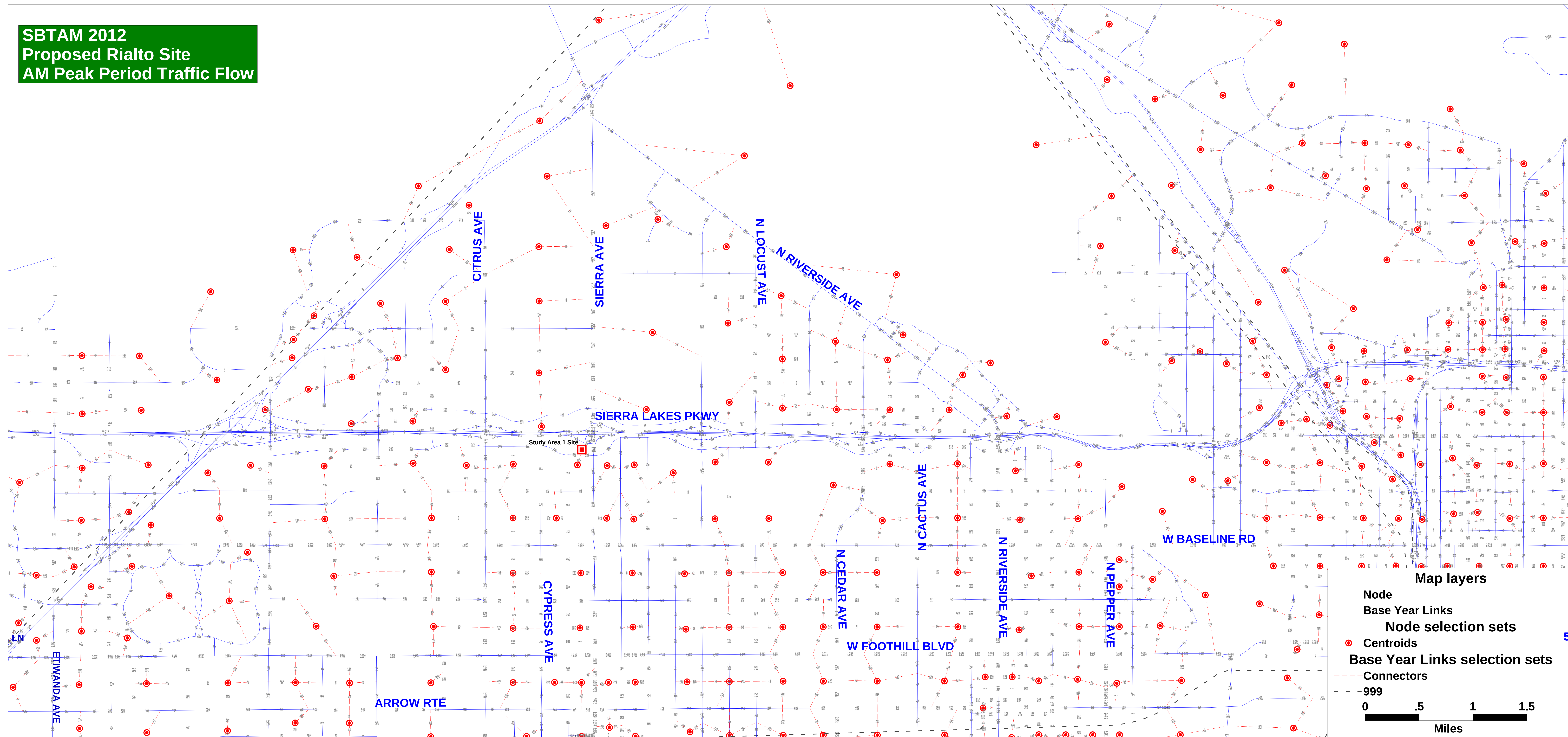
Zone # 4 0

Pk Hr	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In												
N	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
AM Out												
PM In	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PM Out	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

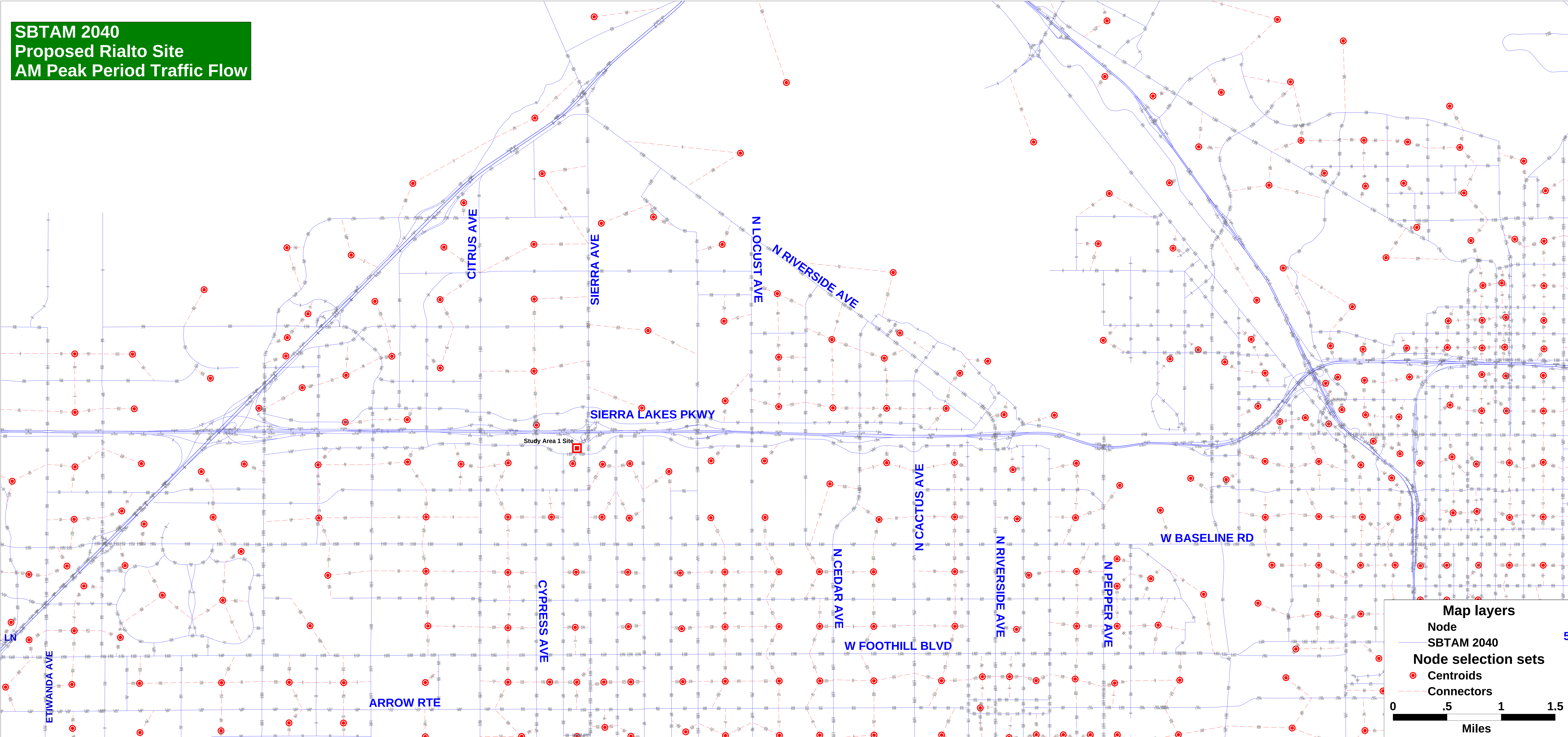
Pk Hr	T Gen	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM In	0	0	0	0	0	0	0	0	0	0	0	0	0
AM Out	0	0	0	0	0	0	0	0	0	0	0	0	0
PM In	0	0	0	0	0	0	0	0	0	0	0	0	0
PM Out	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX E
SBTAM MODEL PLOTS AND B-TURNS WORKSHEETS

SBTAM 2012
Proposed Rialto Site
AM Peak Period Traffic Flow



SBTAM 2040
Proposed Rialto Site
AM Peak Period Traffic Flow



Map layers

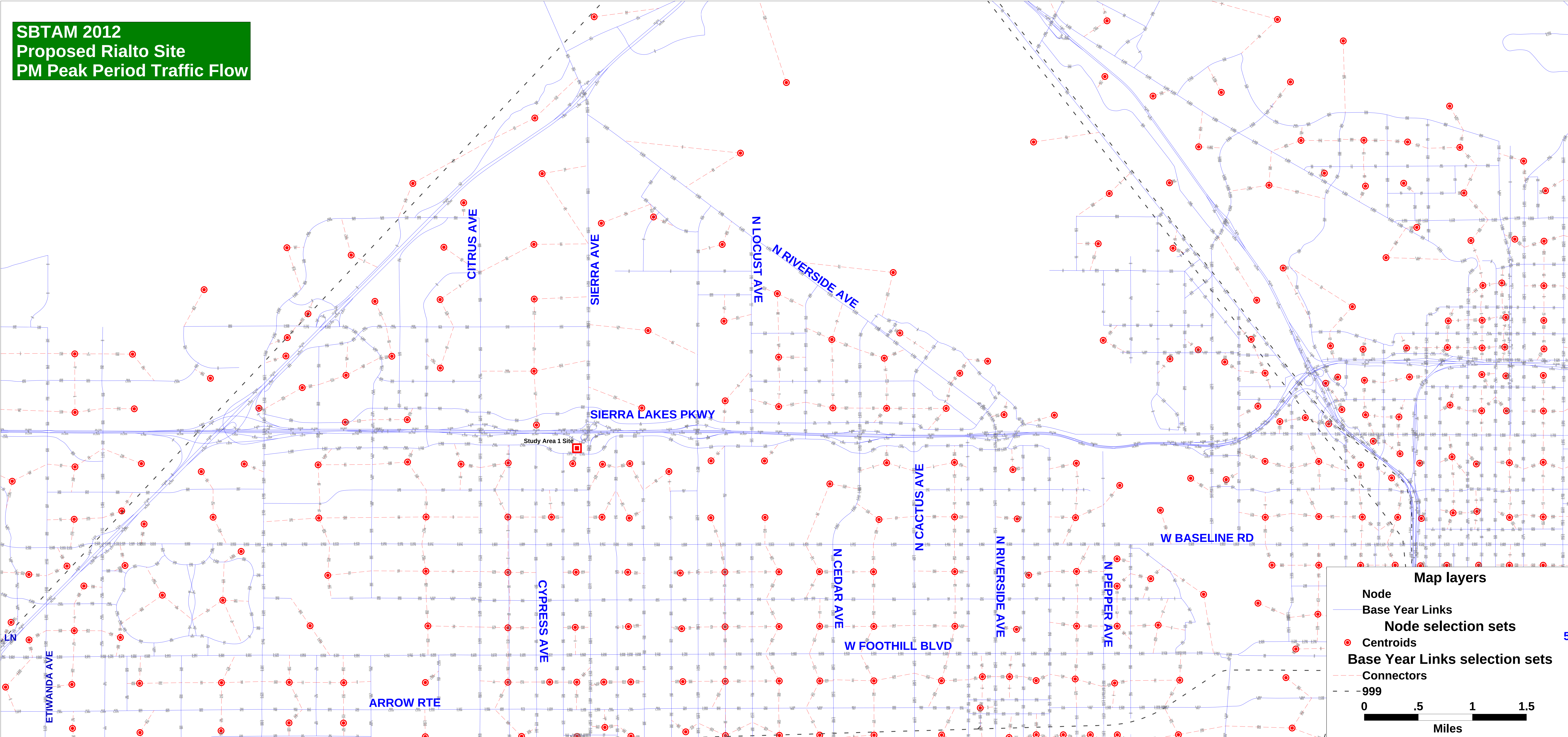
- Node
- SBTAM 2040

Node selection sets

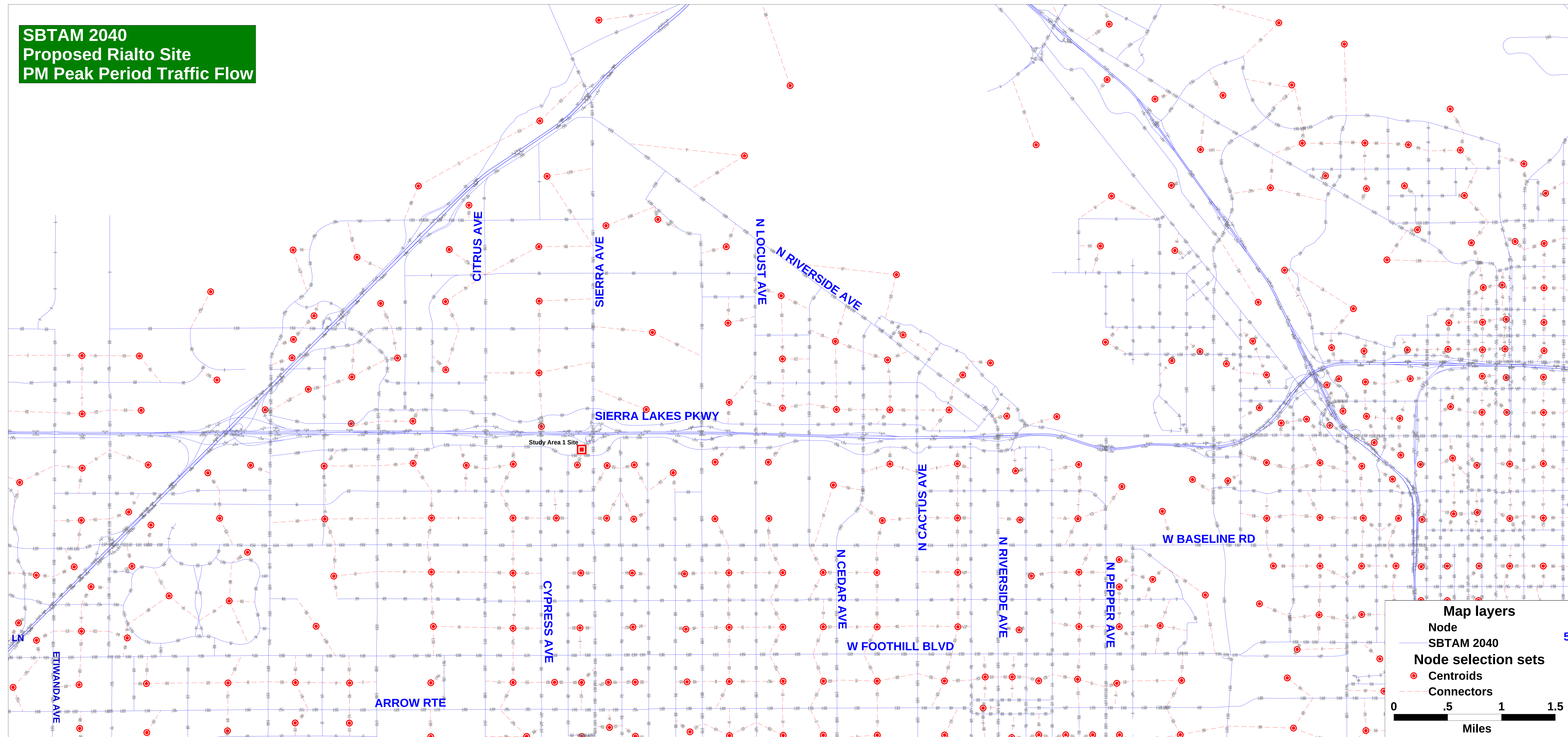
- Centroids
- Connectors

0 .5 1 1.5
Miles

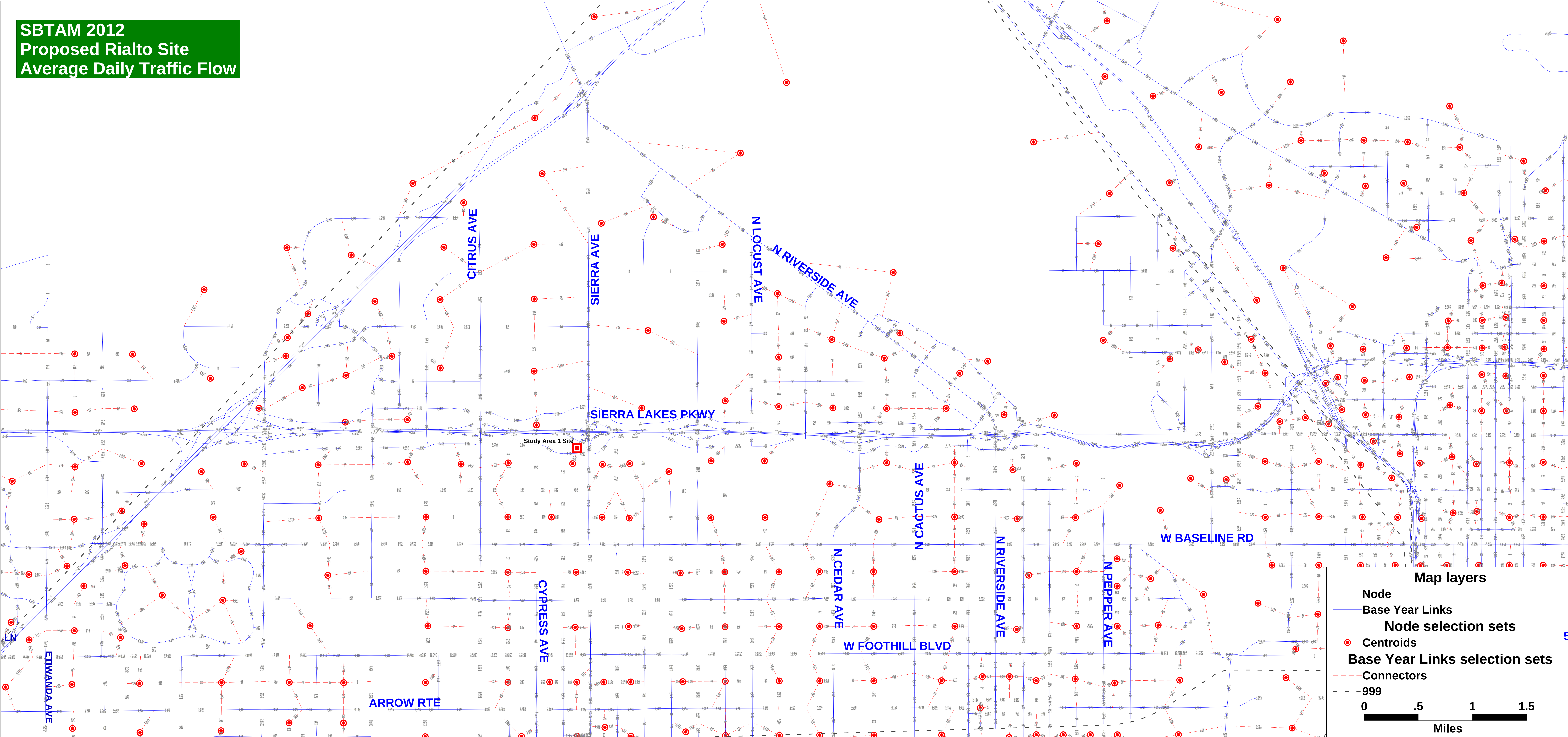
SBTAM 2012
Proposed Rialto Site
PM Peak Period Traffic Flow



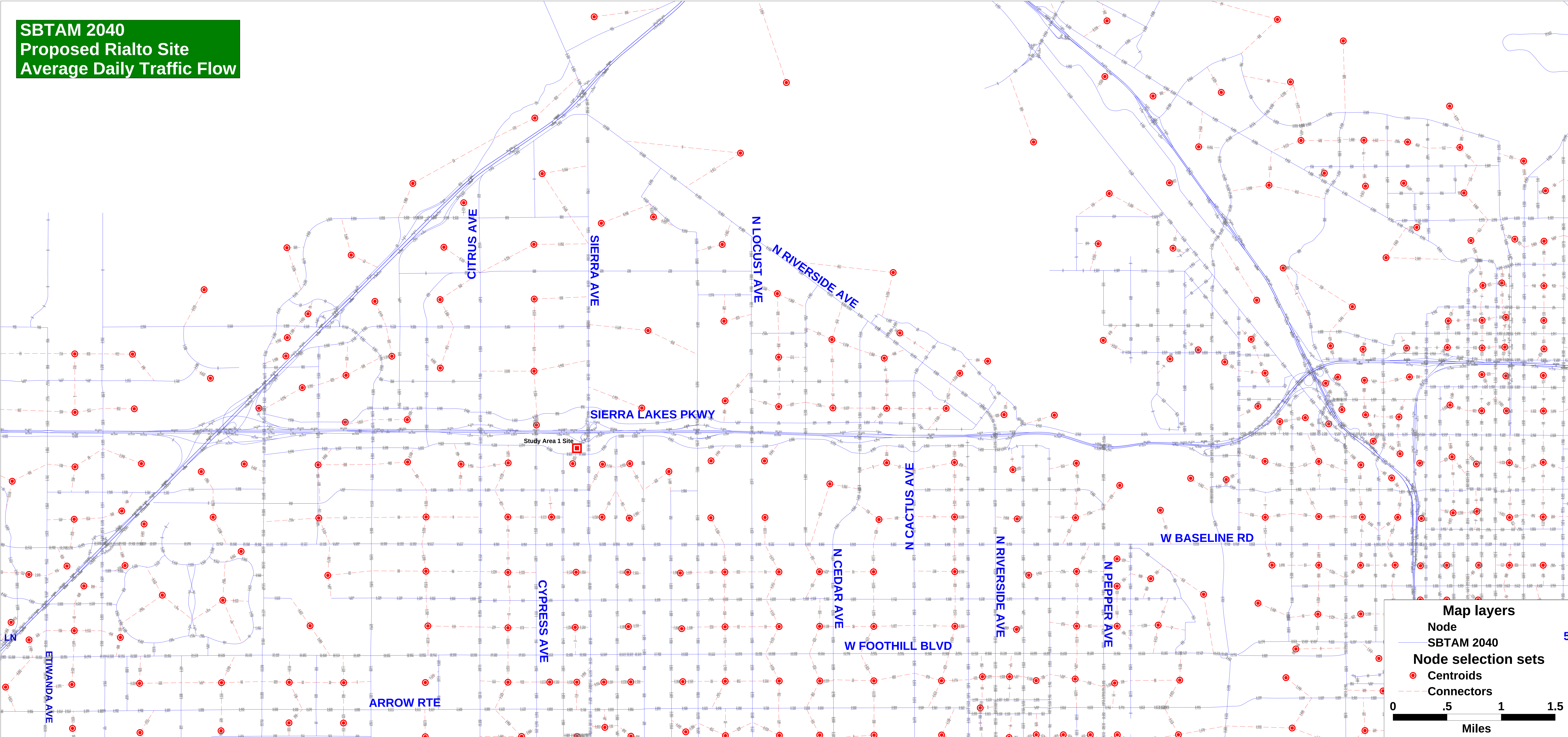
SBTAM 2040
Proposed Rialto Site
PM Peak Period Traffic Flow



SBTAM 2012
Proposed Rialto Site
Average Daily Traffic Flow



SBTAM 2040
Proposed Rialto Site
Average Daily Traffic Flow



Intersection: Sierra Ave Casa Grande Dr

Condition: 2040 Build-out

Peak Hour: AM Peak Hour

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	INTERSECTION LEG	FY	TOTAL
-----	-----	-----	-----		-----
NORTH	LEFT	0	SOUTH LEG		
BOUND	THRU	414	IN ...		714
	RIGHT	28	OUT ...		1,001
SOUTH	LEFT	54	NORTH LEG		
BOUND	THRU	833	IN ...		1,017
	RIGHT	0	OUT ...		727
EAST	LEFT	0	WEST LEG		
BOUND	THRU	0	IN ...		13
	RIGHT	0	OUT ...		12
WEST	LEFT	25	EAST LEG		
BOUND	THRU	0	IN ...		117
	RIGHT	45	OUT ...		120
		1,399			3,721

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
-----	-----	-----	-----
NORTH	LEFT	0	0
BOUND	THRU	414	656
	RIGHT	28	54
SOUTH	LEFT	54	67
BOUND	THRU	833	956
	RIGHT	0	0
EAST	LEFT	0	0
BOUND	THRU	0	0
	RIGHT	0	0
WEST	LEFT	25	45
BOUND	THRU	0	0
	RIGHT	45	72
		1,399	1,849

Intersection: Sierra Ave Casa Grande Dr

Condition: 2040 Build-out

Peak Hour: PM Peak Hour

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	INTERSECTION LEG	FY	TOTAL
-----	-----	-----	-----		-----
NORTH	LEFT	0	SOUTH LEG		
BOUND	THRU	717	IN ...		901
	RIGHT	40	OUT ...		786
SOUTH	LEFT	26	NORTH LEG		
BOUND	THRU	461	IN ...		783
	RIGHT	0	OUT ...		886
EAST	LEFT	0	WEST LEG		
BOUND	THRU	0	IN ...		47
	RIGHT	0	OUT ...		18
WEST	LEFT	31	EAST LEG		
BOUND	THRU	0	IN ...		102
	RIGHT	20	OUT ...		142
		1,295			3,667

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
-----	-----	-----	-----
NORTH	LEFT	0	0
BOUND	THRU	717	844
	RIGHT	40	74
SOUTH	LEFT	26	68
BOUND	THRU	461	725
	RIGHT	0	0
EAST	LEFT	0	0
BOUND	THRU	0	0
	RIGHT	0	0
WEST	LEFT	31	61
BOUND	THRU	0	0
	RIGHT	20	42
		1,295	1,815

Intersection: Sierra Ave SR-210 WB Ramp

Condition: 2040 Build-out

Peak Hour: AM Peak Hour

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	INTERSECTION LEG	FY	TOTAL
-----	-----	-----	-----		-----
NORTH	LEFT	0	SOUTH LEG		
BOUND	THRU	693	IN ...		1,301
	RIGHT	374	OUT ...		1,231
SOUTH	LEFT	0	NORTH LEG		
BOUND	THRU	1093	IN ...		1,398
	RIGHT	245	OUT ...		1,055
EAST	LEFT	0	WEST LEG		
BOUND	THRU	0	IN ...		0
	RIGHT	0	OUT ...		245
WEST	LEFT	4	EAST LEG		
BOUND	THRU	0	IN ...		206
	RIGHT	35	OUT ...		374
		2,444			5,809

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
-----	-----	-----	-----
NORTH	LEFT	0	0
BOUND	THRU	693	884
	RIGHT	374	374
SOUTH	LEFT	0	0
BOUND	THRU	1,093	1,200
	RIGHT	245	245
EAST	LEFT	0	0
BOUND	THRU	0	0
	RIGHT	0	0
WEST	LEFT	4	31
BOUND	THRU	0	0
	RIGHT	35	171
		2,444	2,905

Intersection: Sierra Ave SR-210 WB Ramp

Condition: 2040 Build-out

Peak Hour: PM Peak Hour

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	INTERSECTION LEG	FY	TOTAL
-----	-----	-----	-----		-----
NORTH	LEFT	0	SOUTH LEG		
BOUND	THRU	1,186	IN ...		1,838
	RIGHT	546	OUT ...		1,758
SOUTH	LEFT	0	NORTH LEG		
BOUND	THRU	1,136	IN ...		1,703
	RIGHT	306	OUT ...		1,780
EAST	LEFT	0	WEST LEG		
BOUND	THRU	0	IN ...		0
	RIGHT	0	OUT ...		306
WEST	LEFT	386	EAST LEG		
BOUND	THRU	0	IN ...		849
	RIGHT	467	OUT ...		546
		4,027			8,781

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
-----	-----	-----	-----
NORTH	LEFT	0	0
BOUND	THRU	1,186	1,298
	RIGHT	546	546
SOUTH	LEFT	0	0
BOUND	THRU	1,136	1,391
	RIGHT	306	306
EAST	LEFT	0	0
BOUND	THRU	0	0
	RIGHT	0	0
WEST	LEFT	386	367
BOUND	THRU	0	0
	RIGHT	467	482
		4,027	4,390

Intersection: Sierra Ave SR-210 EB Ramp

Condition: 2040 Build-out

Peak Hour: AM Peak Hour

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	INTERSECTION LEG	FY	TOTAL
-----	-----	-----	-----		-----
NORTH	LEFT	0	SOUTH LEG		
BOUND	THRU	902	IN ...		1,557
	RIGHT	434	OUT ...		2,004
SOUTH	LEFT	0	NORTH LEG		
BOUND	THRU	1307	IN ...		1,763
	RIGHT	329	OUT ...		1,267
EAST	LEFT	144	WEST LEG		
BOUND	THRU	0	IN ...		574
	RIGHT	430	OUT ...		188
WEST	LEFT	0	EAST LEG		
BOUND	THRU	0	IN ...		0
	RIGHT	0	OUT ...		434
		3,546			7,787

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
-----	-----	-----	-----
NORTH	LEFT	0	0
BOUND	THRU	902	1,125
	RIGHT	434	434
SOUTH	LEFT	0	0
BOUND	THRU	1,307	1,573
	RIGHT	329	188
EAST	LEFT	144	143
BOUND	THRU	0	0
	RIGHT	430	431
WEST	LEFT	0	0
BOUND	THRU	0	0
	RIGHT	0	0
		3,546	3,893

Intersection: Sierra Ave SR-210 EB Ramp

Condition: 2040 Build-out

Peak Hour: PM Peak Hour

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	INTERSECTION LEG	FY	TOTAL
-----	-----	-----	-----		-----
NORTH	LEFT	0	SOUTH LEG		
BOUND	THRU	1,429	IN ...		2,153
	RIGHT	637	OUT ...		2,009
SOUTH	LEFT	0	NORTH LEG		
BOUND	THRU	1,146	IN ...		1,820
	RIGHT	395	OUT ...		1,728
EAST	LEFT	212	WEST LEG		
BOUND	THRU	0	IN ...		687
	RIGHT	475	OUT ...		287
WEST	LEFT	0	EAST LEG		
BOUND	THRU	0	IN ...		0
	RIGHT	0	OUT ...		637
		4,294			9,321

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
-----	-----	-----	-----
NORTH	LEFT	0	0
BOUND	THRU	1,429	1,522
	RIGHT	637	637
SOUTH	LEFT	0	0
BOUND	THRU	1,146	1,529
	RIGHT	395	287
EAST	LEFT	212	206
BOUND	THRU	0	0
	RIGHT	475	480
WEST	LEFT	0	0
BOUND	THRU	0	0
	RIGHT	0	0
		4,294	4,660

MEMORANDUM

To: Mahmoud Khodr, P.E., PTOE
City of Fontana

From: Trevor Briggs, P.E.
Kimley-Horn and Associates, Inc.

Date: June 4, 2020

Subject: Traffic Memorandum for the Proposed Sierra Casa Grande Warehouse Residential Replacement Sites – Mango Avenue Site

The following memorandum was prepared to evaluate the trip generation potential and land use integration for the proposed residential replacement site located on the northwest corner (NWC) of Malaga Street and Mango Avenue (Mango Replacement Site) in the City of Fontana.

PROJECT DESCRIPTION

The project is proposing residential replacement sites for the development of residential dwelling units at two project sites within the City of Fontana in efforts to account for the potential residential dwelling units lost with the development of the proposed Sierra Avenue at Casa Grande Drive Warehouse. The two replacement sites are proposed within the City of Fontana and are shown on **Figure 1**. One replacement site is located on the northwest corner of the intersection of Mango Avenue at Malaga Street. The site is currently 5.69 acres and occupied by 14 existing residential dwelling units. The second replacement site, located on the northeast corner of the intersection of Palmetto Avenue at Arrow Boulevard (Palmetto Replacement Site), is mentioned in this memorandum yet analyzed a separate document.

The replacement of residential land uses due to the development of the Sierra Avenue at Casa Grande Drive Warehouse would result in the development of a maximum of 219 new residential dwelling units, in addition to the existing units on each site. The 219 dwelling units would be split proportionally between the two replacement sites as follows:

- Malaga Street/Mango Avenue Site: 195 new dwelling units
 - 14 existing dwelling units
 - **209 onsite total dwelling units**
 - **Proposed Residential Designation: WMXU-1: Walkable Mixed-Use Corridor & Downtown (0.2-2 FAR, 3-39 du/ac)**
- Palmetto Avenue/Arrow Boulevard Site: 24 new dwelling units¹
 - 8 existing dwelling units
 - **32 onsite total dwelling units**
 - **Proposed Residential Designation: -R-2: Medium Density Residential (5.1-12 du/ac)**

¹ The addition of 71 new dwelling units was initially estimated for this site and has since been refined to 24 units. The initial estimate of 71 dwelling units was conservatively used for trip generation analyses.

The City of Fontana *General Plan Land Use Map* as well as the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition) was used to estimate the maximum trip generation for this proposed project. **Table 2** shows the estimated maximum trip generation of the replacement site, and the results are presented as follows:

- **1,427** Daily Trips
- AM Peak Hour – **90** Total Trips
- PM Peak Hour – **109** Total Trips

Based on the trip generation estimates for the proposed project site, a traffic study is not warranted.

SENATE BILL 330 (SB-330)

SB-330, approved in October 2019, is a new law in California that directly affects municipal control over housing development. The main purpose of the bill is to increase housing in California to keep up with the growing population, and does this by restricting measures that prevent low income housing from being built. In summary, the bill restricts cities and counties from taking measures that impede housing development, such as housing bans and downsizing, and expedites the permitting of housing in urbanized areas throughout California.

Within this bill, Governor Newsom has called for the following:

- An additional 180,000 homes annually to keep up with the population growth
- 3.5 million new homes to be built over the next 7 years

SB-330 directly applies to this Sierra Casa Grande Warehouse project, as the project decreases the potential amount of homes in the State of California, and specifically the City of Fontana. SB-330 requires the replacement of this housing at suitable sites within the City of Fontana.

TRIP GENERATION

The City of Fontana *General Plan Land Use Map* (adopted September 10, 2019) indicates that the 15.2-acre site of the proposed Sierra Avenue at Casa Grande Drive Warehouse project is currently designated as R-M: Medium Density Residential (5.1-12 du/ac). Were this site to be developed to its maximum existing land-use density, a total of 183 dwelling units could be developed. With the proposed change in land use to this warehouse site, the potential maximum of 183 dwelling units could be split proportionately and accommodated between the two replacement sites mentioned previously.

The Mango Replacement site (5.69 acres) is currently designated as R-SF: Single Family Residential (2.1-5 du/ac). The 195 replacement dwelling units and the retention of the 14 existing dwelling units on the site would yield a maximum 209 total dwelling units for a density of 36.7 du/ac. This density corresponds with the WMXU-1 Walkable Mixed Use Corridor & Downtown (0.2-2 FAR, 3-39 du/ac) designations found in the *General Plan Land Use Map*. The Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition) was used to estimate the maximum trip generation for the Mango Replacement site. **Table 1** shows a summary of the site's existing and proposed land use designations and densities and **Table 2** shows the estimated maximum trip generation of the Mango Replacement site.

Table 1: Existing and Proposed Site Designations

Site	Size (ac)	Existing Land Use Designation	Existing Dwelling Units	Maximum Potential/New Residential Dwelling Units	Proposed Maximum Dwelling Units	Proposed Land Use Designation
Sierra Ave at Casa Grande Dr Warehouse	15.2	R-M: medium Density Residential (5.1-12 du/ac)	0	183	-	I-L: Light Industrial (0.1-0.6 FAR)
Mango Replacement Site ¹	5.69	R-SF: Single Family Residential (2.1-5 du/ac)	14	195	209	WMXU-1: Walkable Mixed Use Corridor & Downtown (0.2-2 FAR, 3-39 du/ac)
Notes: du = Dwelling Unit ac = acre ¹ An additional 24 du would be replaced at the Palmetto Replacement site.						

Table 2: Estimated Maximum Mango Replacement Site Trip Generation

				Trip Generation Rates and Estimates						
					AM Peak Hour			PM Peak Hour		
	Land Use		Unit	Daily	In	Out	Total	In	Out	Total
Rates	Multifamily Housing (Low-Rise)	ITE Code	DU	7.320	0.106	0.354	0.46	0.353	0.207	0.56
		220								
Estimates	Multifamily Housing (Low-Rise)	Quantity	DU	1,427	21	69	90	69	40	109
		195								
Total Project Trips				1,427	21	36	90	69	40	109

GENERAL ACCESS TO THE SITE ON ROADWAYS

Access to the parcel would be from Malaga Street and Mango Avenue. These streets each have one travel lane in each direction with no sight distance limitations. The proposed project site is at the center of 5 major freeways; CA-210 to the north, I-10 and CA-66 (Foothill Boulevard) to the south, CA-259 to the east, and I-15 to the west. These freeways can take residents from the project site to local locations around the City of Fontana and to different cities such as Los Angeles, Temecula, San Bernardino, or Victorville. To access the all freeways, residents would head north on Sierra Avenue to reach the CA-259 or I-15 onramps, which connect to the CA-210, I-10, and CA-66. The drives from the project location to the CA-259 and I-15 freeway onramps total a 10- to 15-minute trip each.

Three OminTrans transit routes are located within walking distance of the site. Routes 67 and 82 operate on Sierra Avenue with bus stops within 0.2 miles of the site. These routes operate at 1 hour headways and both provide a connection to the Fontana Metrolink station, approximately 1.25 miles to the south. These route schedules are staggered to provide service every 30 minutes. OmniTrans Route 14 has stops on Foothill Boulevard, approximately 0.3 miles from the project site. Route 14 operates at 15-minute headways and provides connections to the San Bernardino Transit Center, the OmniTrans Metro Station and the Fontana Metrolink Station, as well as Fontana City Hall.

Throughout the City of Fontana, the project site location is easily accessible to Grocery Stores, Schools, Downtown Fontana, and Community Parks. To access these locations, residents are close to major east-west corridors through the City: Baseline Avenue, to the north of the site and Foothill Boulevard to the south. Sierra Avenue, running north to south through the City, is one block west of the site. Overall, the project site is located within walking distance to commercial and retail centers along Foothill Boulevard and is central to employment centers within the City.

LAND USE INTEGRATION

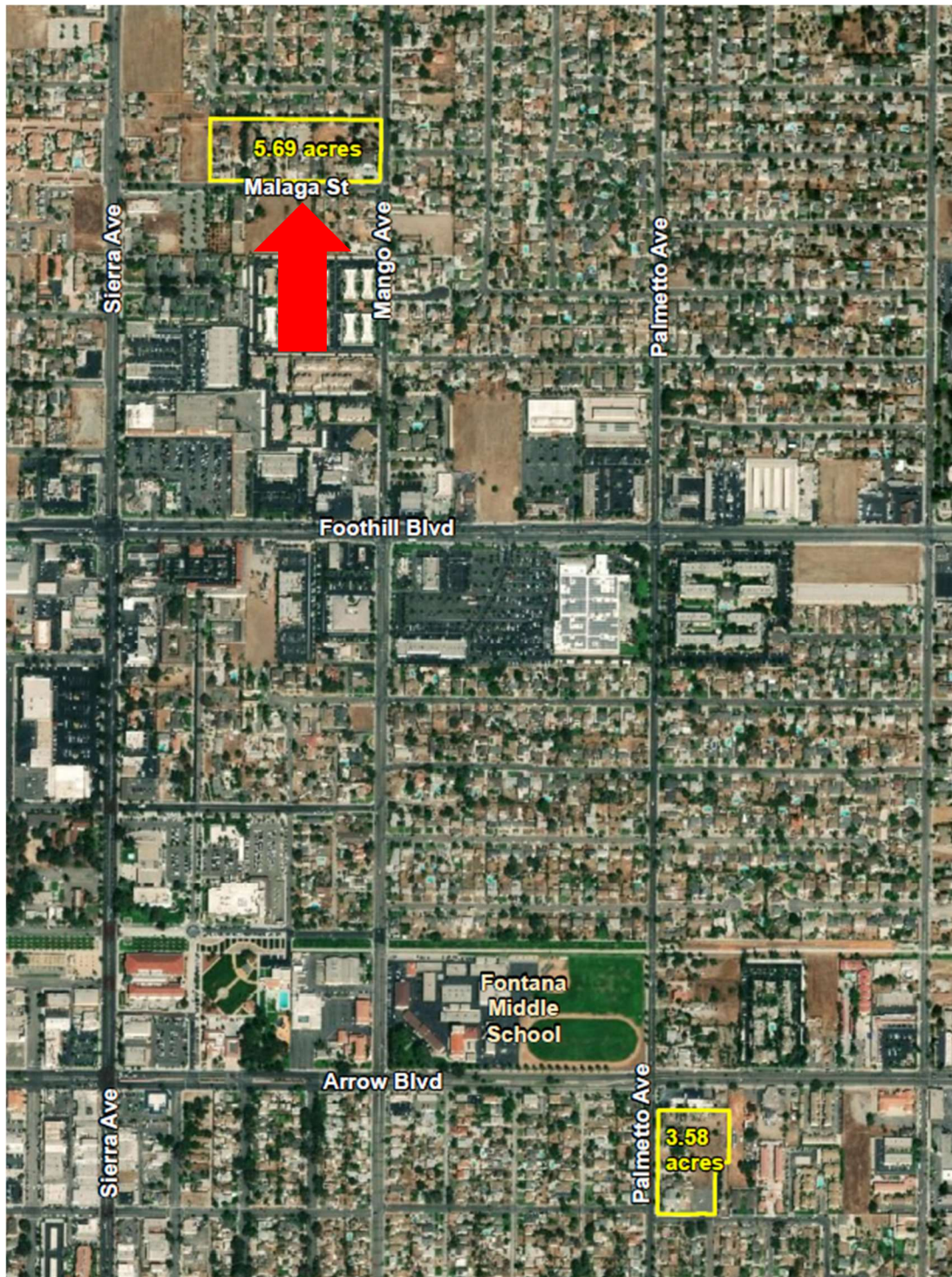
According to the *General Plan Land Use Map*, the project location is surrounded by R-SF: Single Family Residential land use to the north and east, and WMXU-1: Walkable Mixed-Use Corridor & Downtown designations to the south and west. Re-designation of the site from R-SF: Single Family Residential to WMXU-1: Walkable Mixed-Use Corridor & Downtown would be consistent with the surrounding land-use designations and walkable residential nature of the proposed replacement site.

CONCLUSION

According to Appendix B of San Bernardino County's Congestion Management Plan (CMP), "TIA Reports shall be prepared by local jurisdictions when local criteria and thresholds indicate they are necessary. However, TIA reports must be prepared to satisfy CMP requirements, except as noted below, when a proposed change in land use, development project, or at a local discretion, a group of projects are forecast to equal or exceed the CMP threshold of 250 two-way peak hour trips generation, based on trip generation rates published for the applicable use of uses in the Institute of Transportation Engineers' Trip Generation or CMA-approved data source."

The sum of the two-way peak hour trips for the proposed Mango Replacement site is estimated to be less than the 250-trip threshold set forth by the County of San Bernardino. Therefore, a traffic study would not be warranted for this proposed project based on San Bernardino County's CMP thresholds.

Figure 1 - Project Location



MEMORANDUM

To: Mahmoud Khodr, P.E., PTOE
City of Fontana

From: Trevor Briggs, P.E.
Kimley-Horn and Associates, Inc.

Date: June 4, 2020

Subject: Traffic Memorandum for the Proposed Sierra Casa Grande Warehouse Residential Replacement Sites – Palmetto Avenue Site

The following memorandum was prepared to evaluate the trip generation potential and land use integration for the proposed residential replacement site located on the northeast corner (NEC) of Palmetto Avenue and Valencia Avenue (Palmetto Replacement site) in the City of Fontana.

PROJECT DESCRIPTION

The project is proposing residential replacement sites for the development of residential dwelling units at two project sites within the City of Fontana in efforts to account for the potential residential dwelling units lost with the development of the proposed Sierra Avenue at Casa Grande Drive Warehouse. The two replacement sites are proposed within the City of Fontana and are shown on **Figure 1**. One replacement site is located on the northeast corner of the intersection of Palmetto Avenue at Valencia Avenue. The site is currently 3.58 acres and occupied by 8 existing residential dwelling units and a church building. The other replacement site, located on the northwest corner of the intersection of Mango Avenue at Malaga Street (Mango Replacement site), is mentioned in this memorandum yet analyzed in a separate document.

The replacement of residential land uses due to the development of the Sierra Avenue at Casa Grande Drive Warehouse would result in the development of 219 new residential dwelling units, in addition to the existing units on each site. The 219 dwelling units would be split proportionally between the two replacement sites as follows:

- Malaga Street/Mango Avenue Site: 195 new dwelling units
 - 14 existing dwelling units
 - **209 onsite total dwelling units**
 - **Proposed Residential Designation: WMXU-1: Walkable Mixed-Use Corridor & Downtown (0.2-2 FAR, 3-39 du/ac)**
- Palmetto Avenue/Arrow Boulevard Site: 24 new dwelling units¹
 - 8 existing dwelling units
 - **32 onsite total dwelling units**
 - **Proposed Residential Designation: R-2: Medium Density Residential (5.1-12 du/ac)**

¹ The addition of 71 new dwelling units was initially estimated for this site and has since been refined to 24 units. The initial estimate of 71 dwelling units was conservatively used for trip generation analyses.

The City of Fontana *General Plan Land Use Map* as well as the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition) was used to estimate the maximum trip generation for this proposed project. **Table 2** shows the estimated maximum trip generation of the replacement site, based on an initial estimate of 71 dwelling units, and the results are presented as follows:

- **520** Daily Trips
- AM Peak Hour – **33** Total Trips
- PM Peak Hour – **40** Total Trips

Based on the trip generation estimates for the proposed project site, a traffic study is not warranted.

SENATE BILL 330 (SB-330)

SB-330, approved in October 2019, is a new law in California that directly affects municipal control over housing development. The main purpose of the bill is to increase housing in California to keep up with the growing population, and does this by restricting measures that prevent low income housing from being built. In summary, the bill restricts cities and counties from taking measures that impede housing development, such as housing bans and downsizing, and expedites the permitting of housing in urbanized areas throughout California.

Within this bill, Governor Newsom has called for the following:

- An additional 180,000 homes annually to keep up with the population growth
- 3.5 million new homes to be built over the next 7 years

SB-330 directly applies to this Sierra Casa Grande Warehouse project, as the project decreases the potential amount of homes in the State of California, and specifically the City of Fontana. SB-330 requires the replacement of this housing at suitable sites within the City of Fontana.

TRIP GENERATION

The City of Fontana *General Plan Land Use Map* (adopted September 10, 2019) indicates that the 15.2-acre site of the proposed Sierra Avenue at Casa Grande Drive Warehouse project is currently designated as R-M: Medium Density Residential (5.1-12 du/ac). Were this site to be developed to its maximum existing land-use density, a total of 183 dwelling units could be developed. With the proposed change in land use to this warehouse site, the potential maximum of 183 dwelling units could be split proportionately and accommodated between the two replacement sites mentioned previously.

The Palmetto Replacement site (3.58 acres) is currently designated as R-SF: Single Family Residential (2.1-5 du/ac). The 71 replacement dwelling units and the retention of the 8 existing dwelling units on the site would yield a maximum 79 total dwelling units for a density of 22.0 du/ac. This density corresponds with the R-MF: Multi Family Residential (12.1-24 du/ac) or WMXU-1 Walkable Mixed Use Corridor & Downtown (0.2-2 FAR, 3-39 du/ac) designations found in the *General Plan Land Use Map*. The Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition) was used to estimate the maximum trip generation for the Palmetto Replacement site. **Table 1** shows a summary of the site's existing and proposed land use designations and densities and **Table 2** shows the estimated maximum trip generation of the Palmetto Replacement site.

Table 1: Existing and Proposed Site Designations

Site	Size (ac)	Existing Land Use Designation	Existing Dwelling Units	Maximum Potential/New Residential Dwelling Units	Proposed Maximum Dwelling Units	Proposed Land Use Designation
Sierra Ave at Casa Grande Dr Warehouse	15.2	R-M: medium Density Residential (5.1-12 du/ac)	0	183	-	I-L: Light Industrial (0.1-0.6 FAR)
Palmetto Replacement Site ¹	5.69	R-SF: Single Family Residential (2.1-5 du/ac)	8	71	79	R-MF: Multi-Family Residential (12.1-24 du/ac) or WMXU-1: Walkable Mixed Use Corridor & Downtown (0.2-2 FAR, 3-39 du/ac)
Notes: du = Dwelling Unit ac = acre ¹ An additional 195 du would be replaced at the Mango Replacement site.						

Table 2: Estimated Maximum Palmetto Replacement Site Trip Generation

				Trip Generation Rates and Estimates						
				Daily	AM Peak Hour			PM Peak Hour		
	Land Use	ITE Code	Unit		In	Out	Total	In	Out	Total
Rates	Multifamily Housing (Low-Rise)	220	DU	7.320	0.106	0.354	0.46	0.353	0.207	0.56
Estimates	Multifamily Housing (Low-Rise)	71	DU	520	8	25	33	25	15	40
Total Project Trips				520	8	25	33	25	15	40

GENERAL ACCESS TO THE SITE ON ROADWAYS

Access to the parcel would be from Palmetto Avenue and Valencia Avenue to the south. Both streets have one lane in each direction. It is suggested that project access onto Palmetto Avenue be restricted within the 200 feet of Arrow Boulevard to not conflict with the northbound left-turn lane at the signalized intersection. The proposed project site is surrounded by 5 major freeways; CA-210 and CA-66 (Foothill Boulevard) to the north, I-10 to the south, CA-259 to the east, and I-15 to the west. These freeways can take residents from the project site to local locations around the City of Fontana to different cities such as Los Angeles, Temecula, San Bernardino, or Victorville. To access all freeways, residents would head east onto Palmetto Avenue, turn north onto Sierra Avenue, and follow the corridor to the CA-259 or I-15 onramps, which connect to the CA-210, I-10, and CA-66. The drive from the project location to the CA-259 and I-15 freeway onramps total a 15- to 20-minute trip each.

OmniTrans Route 12 operates at one-hour headways along Arrow Boulevard, with bus stops about 0.1 miles from the project. This route provides connections to the Fontana Metrolink Station, which is about ¾ mile southwest of the project.

Throughout the City of Fontana, the project site location is easily accessible to Schools, Grocery Stores, Downtown Fontana, and Community Parks. To access these locations, residents are close to major corridors that run throughout the entire city; Foothill Boulevard, running east to west, is just north of Arrow Boulevard, and Sierra Avenue, running north to south, is two blocks west of Palmetto Avenue. Additionally, the proposed project site is within walking distance to Fontana Middle School as well as commercial and retail centers along Arrow Boulevard that are central to the City.

LAND USE INTEGRATION

According to the *General Plan Land Use Map*, the project location is surrounded by R-SF: Single Family Residential land use to south, east, and west, R-M: Medium Density Residential to the north, and P-PF: Public Facilities and WMXU-1: Walkable Mixed-Use Corridor & Downtown designations to the northwest. Re-designation of the site from R-SF: Single Family Residential to R-MF: Multi-Family Residential (12.1-24 du/ac) or WMXU-1: Walkable Mixed Use Corridor & Downtown (0.2-2 FAR, 3-39 du/ac) would be consistent with the surrounding land-use designations and walkable residential nature of the proposed replacement site.

CONCLUSION

According to Appendix B of San Bernardino County's *Congestion Management Plan (CMP)*, "TIA Reports shall be prepared by local jurisdictions when local criteria and thresholds indicate they are necessary. However, TIA Reports must be prepared to satisfy CMP requirements, except as noted below, when a proposed change in land use, development project, or at local discretion, a group of projects are forecast to equal or exceed the CMP threshold of 250 two-way peak hour trips generation, based on trip generation rates published for the applicable use of uses in the Institute of Transportation Engineers' Trip Generation or CMA-approved data source."

The sum of the two-way peak hour trips for the proposed Palmetto Replacement site is estimated to be less than the 250-trip threshold set forth by the County of San Bernardino, therefore, a traffic study would not be warranted for this proposed project based on the San Bernardino County's CMP thresholds.

Figure 1 - Project Location

