

DRAFT Traffic Impact Study Medical Office Building, Parking Structure, Emergency Department/ Intensive Care Unit

Addendum to the Certified
Final Program
Environmental Impact Report
Queen of the Valley Hospital
Phases 1A and 1B



December 2020



TRAFFIC IMPACT STUDY
MEDICAL OFFICE BUILDING, PARKING STRUCTURE, EMERGENCY
DEPARTMENT/INTENSIVE CARE UNIT
ADDENDUM TO THE CERTIFIED FINAL PROGRAM
ENVIRONMENTAL IMPACT REPORT
QUEEN OF THE VALLEY
PHASES 1A AND 1B
WEST COVINA, CA

PREPARED FOR



PREPARED BY

P S O M A S

PSOMAS PROJECT NO. 3EMA010100

DECEMBER 2020

TABLE OF CONTENTS

<u>1. INTRODUCTION</u>	<u>1</u>
1.1. STUDY AREA _____	3
1.2. ANALYSIS METHODOLOGY _____	3
1.2.1. INTERSECTION CAPACITY UTILIZATION (ICU) _____	5
1.2.2. HIGHWAY CAPACITY MANUAL _____	5
<u>2. EXISTING STUDY AREA CONDITIONS</u>	<u>6</u>
2.1. PROJECT ACCESS _____	6
2.2. TRAFFIC VOLUMES _____	6
<u>3. PROJECT DESCRIPTION</u>	<u>10</u>
<u>4. PROJECTED TRAFFIC VOLUMES</u>	<u>11</u>
4.1. CUMULATIVE GROWTH AND TRAFFIC VOLUMES _____	11
4.2. PROJECT TRAFFIC VOLUMES _____	11
4.2.1. PROJECT TRIP GENERATION _____	11
4.2.2. PROJECT TRIP DISTRIBUTION _____	11
4.2.3. PROJECT TRAFFIC VOLUMES _____	11
4.3. EXISTING + CUMULATIVE + PROJECT TRAFFIC VOLUMES _____	15
<u>5. SIGNIFICANT IMPACT ANALYSIS</u>	<u>17</u>
<u>6. SITE DRIVEWAY ANALYSIS</u>	<u>19</u>
6.1. QUEUING _____	19
6.2. SIGHT DISTANCE _____	20
<u>7. CONSTRUCTION TRAFFIC</u>	<u>22</u>
<u>8. FAIR SHARE CONTRIBUTION</u>	<u>23</u>
<u>9. SUMMARY</u>	<u>24</u>

APPENDIX A – ICU SPREADSHEETS AND SYNCHRO REPORTS

APPENDIX B – SYNCHRO REPORTS FOR SITE ACCESS POINTS

APPENDIX C – ICU SPREADSHEETS AND SYNCHRO REPORTS – PHASES 1A AND 1B

APPENDIX D – ICU SPREADSHEETS AND SYNCHRO REPORTS – PHASES 1A, 1B, AND 2

APPENDIX E – ICU SPREADSHEETS AND SYNCHRO REPORTS – BUILDOUT CONDITIONS

LIST OF FIGURES

FIGURE 1. SITE LOCATION _____	2
FIGURE 2. STUDY INTERSECTIONS _____	4
FIGURE 3. EXISTING (2018) PEAK HOUR TRAFFIC VOLUMES _____	9
FIGURE 4. 2022 CUMULATIVE TRAFFIC VOLUMES _____	12
FIGURE 5. PROJECT TRIP DISTRIBUTION _____	13
FIGURE 6. PROJECT TRAFFIC VOLUMES _____	14
FIGURE 7. EXISTING + CUMULATIVE + PROJECT TRAFFIC VOLUMES (2022) _____	16
FIGURE 8. SIGHT VISIBILITY TRIANGLES _____	21

LIST OF TABLES

TABLE 1. SIGNIFICANT IMPACT THRESHOLDS – ICU METHODOLOGY _____	5
TABLE 2. ESTIMATED EXISTING (2018) QUEEN OF THE VALLEY TRIP GENERATION _____	7
FIGURE 3. ESTIMATED EXISTING (2018) MEDICAL/DENTAL OFFICE TRIP GENERATION _____	7
TABLE 4. PROJECT TRIP GENERATION _____	11
TABLE 5. ADJUSTED PROJECT TRIPS _____	15
TABLE 6. EXISTING + CUMULATIVE + PROJECT SIGNIFICANT IMPACTS _____	17
TABLE 7. 95 TH PERCENTILE QUEUES WITH PROJECT (FEET) _____	19
TABLE 8. PROJECT FAIR SHARE CONTRIBUTION _____	23

1. INTRODUCTION

The Queen of the Valley Hospital was founded in 1962 in the City of West Covina as shown in Figure 1. Existing services provided at the hospital include a Primary Stroke Center, a Family Birth and Newborn Center, a Level IIIB Newborn Intensive Care Unit (ICU), da Vinci Robotic Surgery, and Inpatient and Outpatient Rehabilitation services for adults and children. The hospital currently has approximately 355,000 square feet of various single- and multi-level structures, with surface parking provided throughout the site. A medical office building on site is approximately 89,000 square feet. The hospital is surrounded by various land uses, including primarily single- and multi-family residential uses, park and recreation uses, and other medical office uses.

To meet the increasing care needs of the community, a multi-phase improvement project is underway at the Hospital, including a major addition and renovations. The larger improvement project was evaluated in the *Traffic Impact Study for Queen of the Valley Hospital Specific Plan¹ (2019 TIS)* as part of the Environmental Impact Report (EIR). The EIR was accepted in 2019. This report provides a more detailed analysis of traffic operations for the Phases 1A and 1B, which include the addition of emergency room and ICU space as well as a new medical office building. In the original study, Phases 1A and 1B were scheduled to be completed in 2022, which is the assumption for this report.

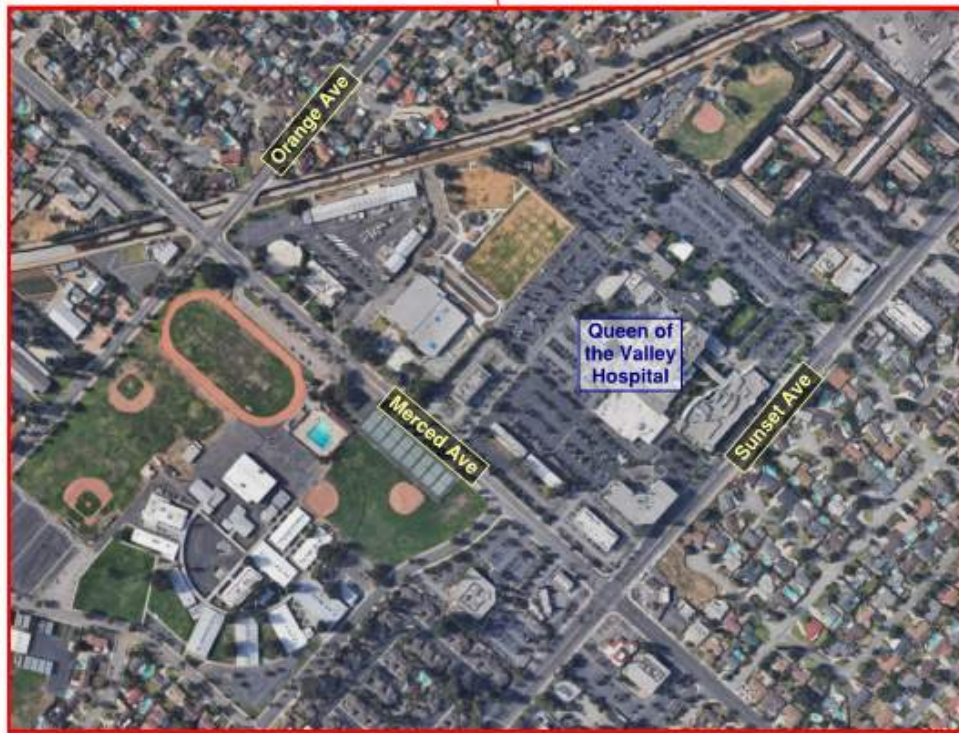
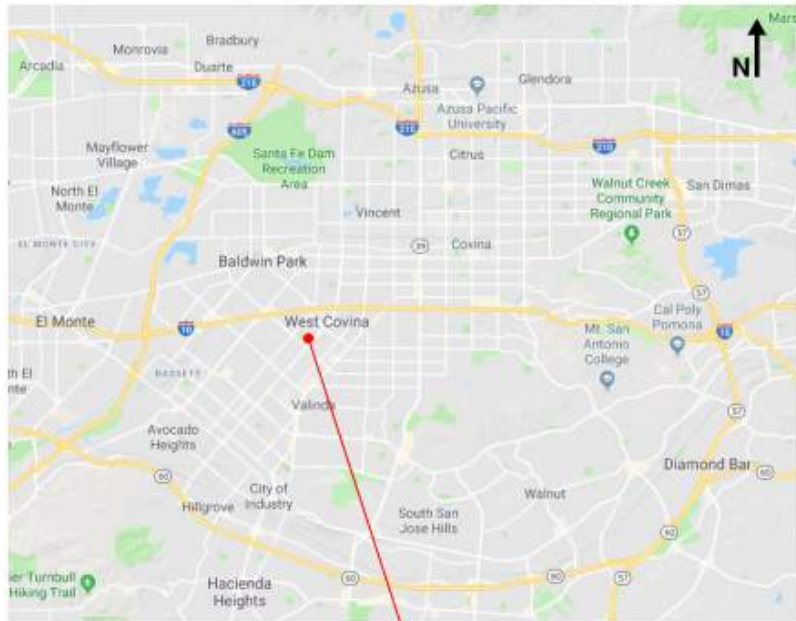
In this study, the original Phases 1A and 1B will be referred to as the Project. In the original traffic study, the Project included the following:

- Demolish 20,000 sq. ft. of existing hospital space
- Construct new emergency room expansion (33,000 sq. ft.) and new ICU (33,000 sq. ft.)
- Construct new medical office (90,000 sq. ft.)

Given the more detailed design underway, the Project now includes the following:

- Demolish 9,408 sq. ft. of existing hospital space
- Construct new emergency department/ICU (58,901 sq. ft.)
- Construct new medical office (58,868 sq. ft.)

Figure 1. Site Location



Note that the project includes other internal renovations and construction of parking structures, but those aspects of the project are not expected to alter the trip generation and are therefore not listed in the project description nor are they further discussed in this report.

Because the Project is smaller than what was originally evaluated in the *2019 TIS*, it is considered to be consistent with the 2019 EIR and no further operational analysis is required. However, this study will evaluate the project driveways to ensure that sufficient turn lane storage is available and will provide recommendations for which previously identified mitigation measures are still applicable for the reduced Project size.

For this study, traffic impact analyses were conducted for conditions with the project at the completion of Phases 1A and 1B, assumed to be in 2022. The study area and traffic impact analysis methodology used in this study are described in the following sections.

1.1. STUDY AREA

The study area includes the four site access points, shown in Figure 2 and listed below:

1. Merced Avenue/North Driveway (unsignalized)
2. Medical Office Driveway/Sunset Avenue (unsignalized)
3. East Driveway/Sunset Avenue (unsignalized)
4. Vine Avenue/Sunset Avenue (signalized)

The signalized intersection of Vine Avenue and Sunset Avenue was previously evaluated in the *2019 TIS*, but queuing analysis was not completed. All four intersections are existing. In addition, to evaluate the need for the previously determined mitigation measures, the four existing intersections of Cameron Avenue/Sunset Avenue (signalized), Merced Avenue/Dalewood Street/Garvey Avenue (unsignalized), Merced Avenue/California Avenue (signalized), and Cameron Avenue/Orange Avenue (signalized). Those four intersections were identified in the *2019 TIS* as requiring mitigation at the completion of Phases 1A and 1B.

1.2. ANALYSIS METHODOLOGY

Level of Service (LOS) is the typical measure used to characterize the quality of traffic operations at an intersection or roadway segment. LOS A represents relatively free operating conditions, whereas LOS F has unstable flow and congestion with volumes at or near the capacity of the facility. Excessive delays and queues can occur when the LOS is not acceptable.

Figure 2. Study Intersections



To assess the potential need to incorporate the mitigation measures previously identified for the completion of Phase 1, conditions for 2022 with and without the Project were evaluated for the four signalized intersections listed in the previous section. To evaluate the queues and potential need for additional turn lane storage, conditions for 2022 with the Project were evaluated.

Signalized intersections were evaluated using the Intersection Capacity Utilization (ICU) methodology to maintain consistency with the 2019 TIS. For the unsignalized intersections, operational analyses were based on the HCM methodology per the *Los Angeles County Public Works Transportation Impact Analysis Guidelines*². Per direction from the City of West Covina, VMT analyses are not required because the Project is consistent with the previously-approved 2019 EIR. The methodologies and significance thresholds are discussed further in the following sections.

1.2.1. Intersection Capacity Utilization (ICU)

The ICU methodology is used to determine the operating LOS of signalized intersections. This methodology requires the calculation of the intersection volume/capacity (V/C) ratio, which is the summation of critical lane group flow ratios with a yellow clearance adjustment. The LOS estimated by the ICU methodology is directly related to the intersection V/C ratio.

The impact related to the project is considered significant if the increase in the volume to capacity (V/C) ratio with the project equals or exceeds the values shown in Table 1.

Table 1. Significant Impact Thresholds – ICU Methodology

Intersection Conditions Pre-Project		Project V/C Increase
LOS	V/C	
C	0.71 to 0.80	0.04 or more
D	0.81 to 0.90	0.02 or more
E/F	0.91 or more	0.01 or more

1.2.2. Highway Capacity Manual

Per the LA County guidelines, this study applied the *HCM* methodology to evaluate unsignalized intersections using the software *Synchro*. The significant impact for the unsignalized intersection of Merced Avenue/Dalewood Street/Garvey Avenue was based on the LADOT guidelines³, which evaluate unsignalized intersections using the HCM methodology to determine the need for the installation of a traffic signal or other traffic control devices. Based on the estimated delay, if the resultant LOS is E or F in the “Future with Project” scenario, it is recommended that a traffic signal warrant analysis be conducted.

Note that the LOS was not evaluated at the study intersections; instead, the analysis focuses on the queuing at the intersections, particularly the queues on Merced Avenue and Sunset Avenue for vehicles turning into the site.

2. EXISTING STUDY AREA CONDITIONS

2.1. PROJECT ACCESS

There are four existing site access locations, all of which are expected to remain as the campus develops. Those four study intersections are discussed below:

1. **Merced Avenue/North Driveway** – This unsignalized intersection operates with two-way stop control on the driveway. There is no northwest-bound right turn lane on Merced Avenue, but the existing two-way left turn lane provides storage for vehicles turning left into the site. The driveway has one inbound and one outbound lane and allows both left and right turns onto Merced Avenue.
2. **Medical Office Driveway/Sunset Avenue** – This unsignalized intersection operates with two-way stop control on the driveway. The driveway only allows right turns into and out of the site, but there is no exclusive right turn lane on Sunset Avenue. The driveway has one inbound and one outbound lane.
3. **East Driveway/Sunset Avenue** – This unsignalized intersection operates with two-way stop control on the driveway. There is no right turn lane on Sunset Avenue into the site, but there is an existing left turn lane with approximately 95 feet of storage. The driveway has one inbound and one outbound lane, and left turns are not permitted from the driveway onto Sunset Avenue.
4. **Vine Avenue/Sunset Avenue** – This signalized intersection includes left turn lanes on Sunset Avenue and operates with permissive left turns only. Both existing left turn lanes on Sunset Avenue have approximately 140 feet of storage. There are no right turn lanes on Sunset Avenue. On Vine Avenue, both approaches include a shared through-left turn lane and an exclusive right turn lane. For the Project site, Vine Avenue has two inbound lanes.

2.2. TRAFFIC VOLUMES

Due to the ongoing Covid-19 pandemic, traffic volumes at the study intersections could not be collected. Therefore, the 2018 volumes collected for the 2019 TIS were used for the signalized intersections.

Driveway volumes were estimated based on the 2018 volumes and the estimated trip generation calculated using Institute of Transportation Engineers (ITE) *Trip Generation Manual*⁴ for the site as it was in 2018. Table 2 shows the estimated site trip generation in 2018 for reference. An additional medical/dental office unrelated to the hospital also has access from the Vine Avenue/Sunset Avenue intersection; the estimated trip generation for that building is shown in Table 3.

Table 2. Estimated Existing (2018) Queen of the Valley Trip Generation

Existing						
ITE LU 610 (10th Edition) - Hospital						
1,000 SF			355.380			
Period	Trips/Unit	Trips	% In	% Out	Trips In	Trips Out
AM Peak	0.89	316	68%	32%	215	101
PM Peak	0.97	345	32%	68%	110	234
Daily	10.72	3,810	50%	50%	1,905	1,905

Existing						
ITE LU 720 (10th Edition) - Medical-Dental Office Building						
1,000 SF			88.786			
Period	Trips/Unit	Trips	% In	% Out	Trips In	Trips Out
AM Peak	2.78	247	78%	22%	193	54
PM Peak	3.46	307	28%	72%	86	221
Daily	34.80	3,090	50%	50%	1,545	1,545

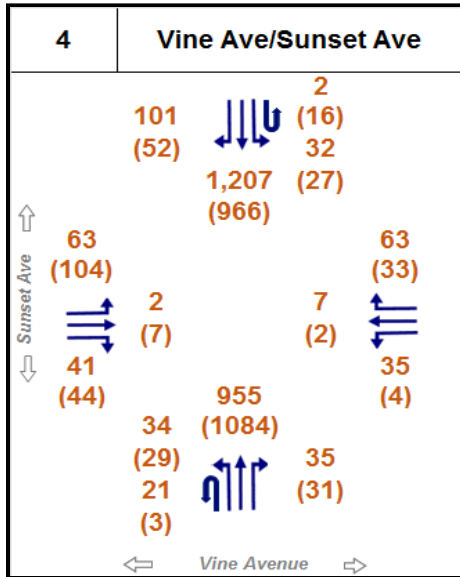
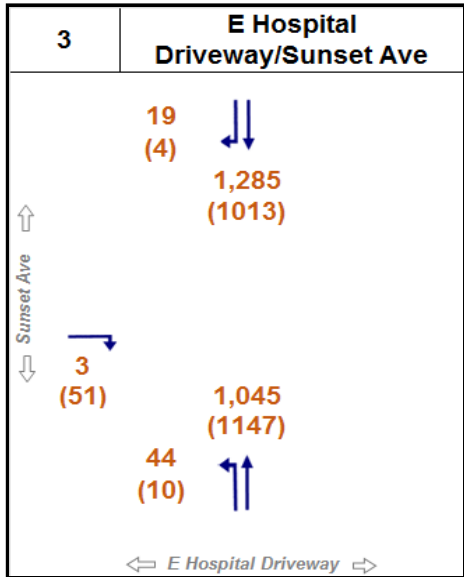
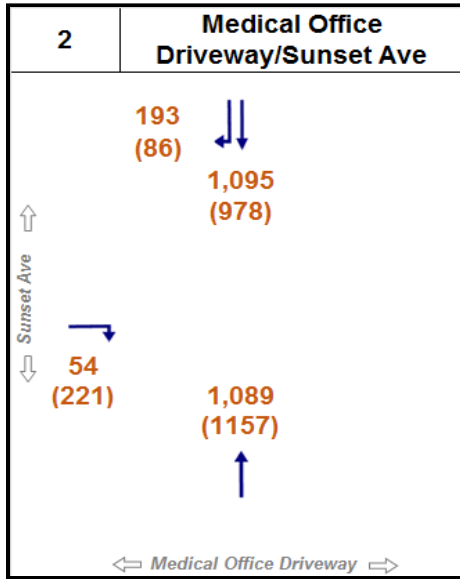
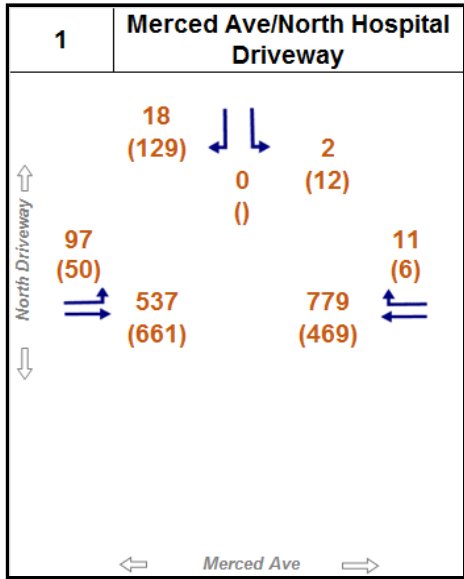
Table 3. Estimated Existing (2018) Medical/Dental Office Trip Generation

Unrelated Existing Medical/Dental Office						
ITE LU 720 (10th Edition) - Medical-Dental Office Building						
1,000 SF			45			
Period	Trips/Unit	Trips	% In	% Out	Trips In	Trips Out
AM Peak	2.78	125	78%	22%	98	28
PM Peak	3.46	156	28%	72%	44	112
Daily	34.80	1,566	50%	50%	783	783

Based on the layout of the facility, it was assumed that 100% of the Queen of the Valley medical office building traffic uses the Medical Office Building driveway located along Sunset Avenue between Merced Avenue and Vine Avenue (study intersection #2).

The Queen of the Valley hospital traffic was assumed to be split between the North Driveway, the East Driveway, and the Vine Avenue/Sunset Avenue intersection. Because volumes were collected at the latter intersection, no adjustments were required; it is also assumed that 100% of the unrelated medical/dental office traffic volumes use the same intersection.

For the remaining hospital traffic, it was assumed that 70% enters the site using the North Driveway and 30% enters the site via the East Driveway. Exiting traffic is slightly different due to the turning movement restrictions and location of on-site parking, with 75% using the North Driveway and 25% using the East Driveway. The collected and estimated 2018 traffic volumes are shown in Figure 3.



LEGEND
 xx AM Peak Hour Traffic Volume (veh/hr)
 (xx) PM Peak Hour Traffic Volume (veh/hr)

Figure 3.
 Existing (2018) Traffic Volumes

3. PROJECT DESCRIPTION

To meet the growing critical care needs of the community, the Queen of the Valley Hospital Campus will be expanded and renovated. The eventual improvements will be built in several phases, including demolition of existing buildings, construction of new buildings, renovation of existing facilities, construction of new parking (both surface and structure), and additional signage/monumentation.

For the purposes of this study, the renovation of existing facilities, construction of new parking, and signage are not significant. This study only includes evaluation of conditions at the completion of Phase 1, which will include the following improvements:

1. Demolition of 9,408 SF of existing hospital uses
2. Addition of 58,901 SF of emergency department/ICU (hospital) uses
3. Construction of new 58,868 SF medical office building (MOB)

As previously mentioned, both the hospital expansion and the new MOB are smaller than what was previously studied. The demolished area is also smaller, but the net new hospital space is still smaller than it was in the 2019 EIR. The existing project access locations are not expected to change with the Project.

4. PROJECTED TRAFFIC VOLUMES

4.1. CUMULATIVE GROWTH AND TRAFFIC VOLUMES

The cumulative traffic volumes are the anticipated traffic volumes in a future year without the project traffic. The anticipated annual growth for the 2019 TIS was 1.4% per year and was maintained for this study. Figure 4 shows the anticipated traffic volumes for 2022 without the Project.

4.2. PROJECT TRAFFIC VOLUMES

4.2.1. Project Trip Generation

The anticipated traffic generation for the Project was estimated using the ITE *Trip Generation Manual* for morning and afternoon weekday peak hour trips. The resulting project trip generation is shown in Table 4. For comparison, note that the Project as evaluated in the 2019 TIS was expected to generate 3,625 new daily trips including 291 new AM peak hour trips and 356 new PM peak hour trips.

Table 4. Project Trip Generation

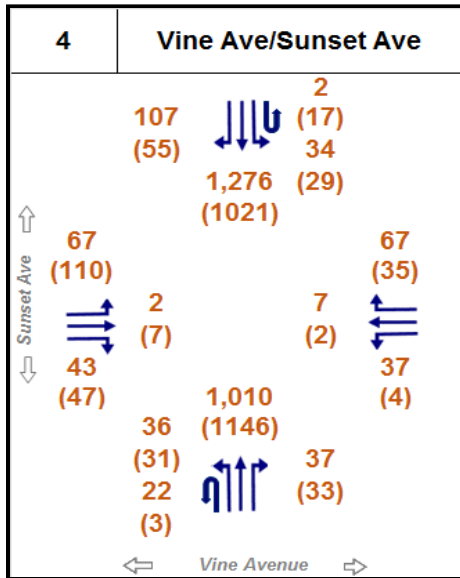
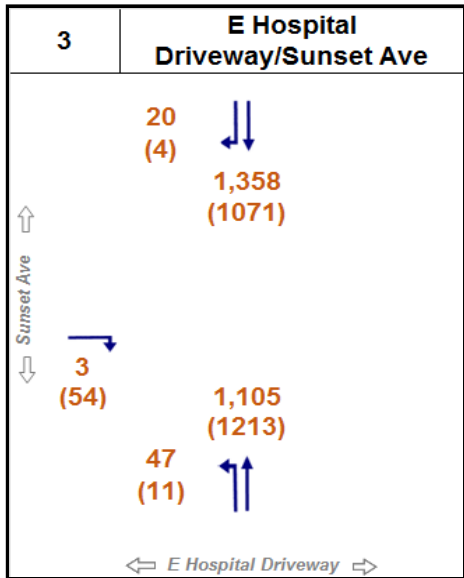
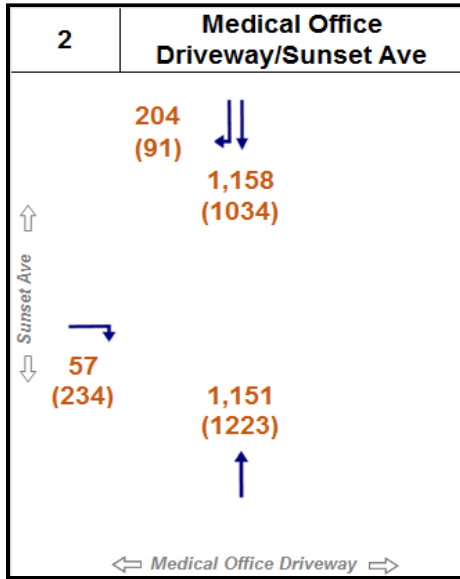
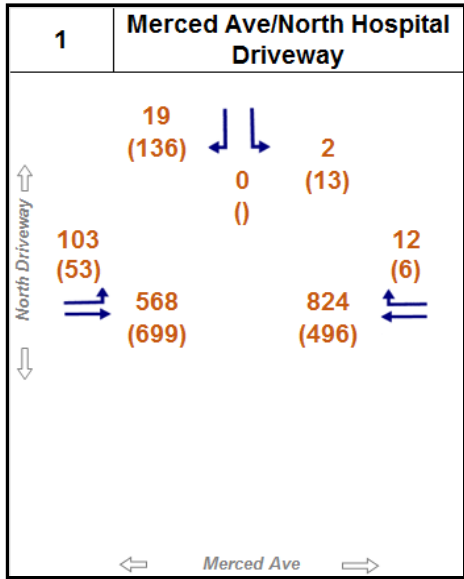
Development Type	Units	Number of Units	Daily	AM		PM	
				In	Out	In	Out
Immediate Improvements							
Hospital Area to be Demolished	1,000 SF	9.408	-101	-6	-3	-3	-6
Phase 1A (2022)							
New Medical Office Building	1,000 SF	58.868	2,049	128	36	57	147
Phase 1B (2022)							
Addition of Emergency Department/ICU	1,000 SF	58.901	631	36	17	18	39
Total New Trips at the end of Phase 1			2,579	158	50	72	179

4.2.2. Project Trip Distribution

The project trip distribution is shown in Figure 5. The distribution matches what was shown in the 2019 TIS to maintain consistency.

4.2.3. Project Traffic Volumes

Using the Project trip generation and trip distribution, the Project traffic volumes were calculated and are shown in Figure 6.



LEGEND
 xx AM Peak Hour Traffic Volume (veh/hr)
 (xx) PM Peak Hour Traffic Volume (veh/hr)

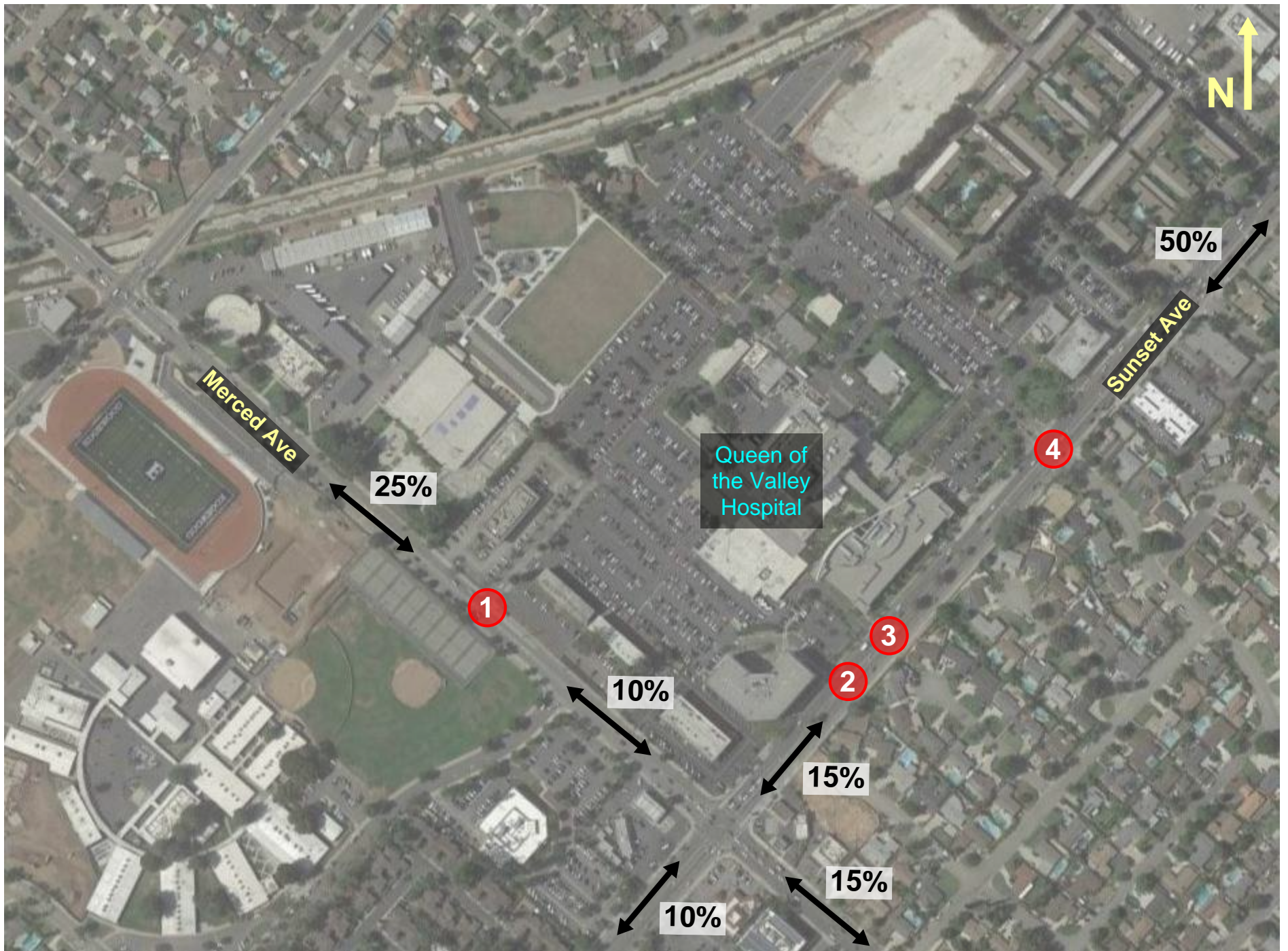
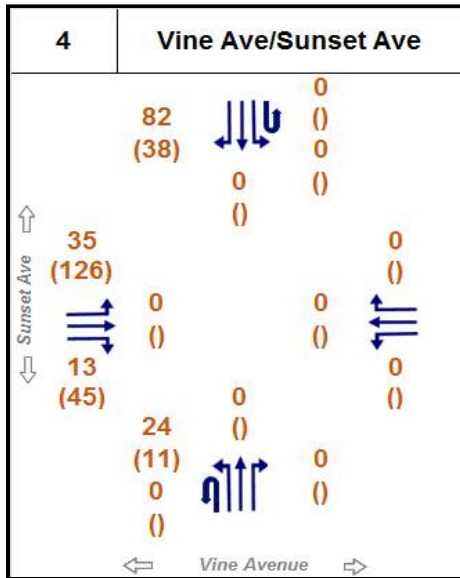
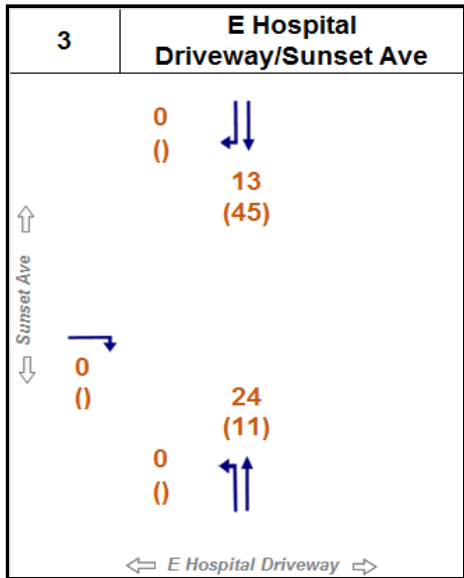
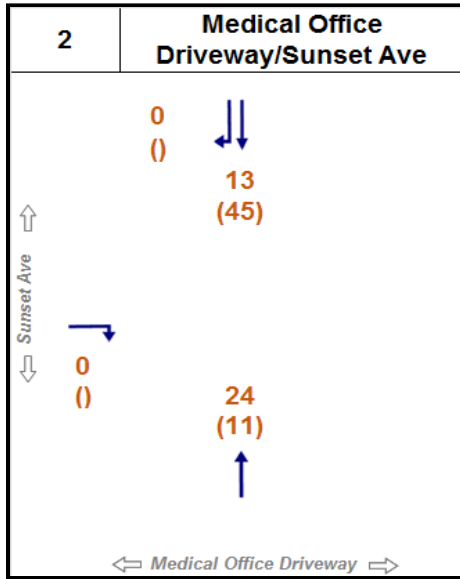
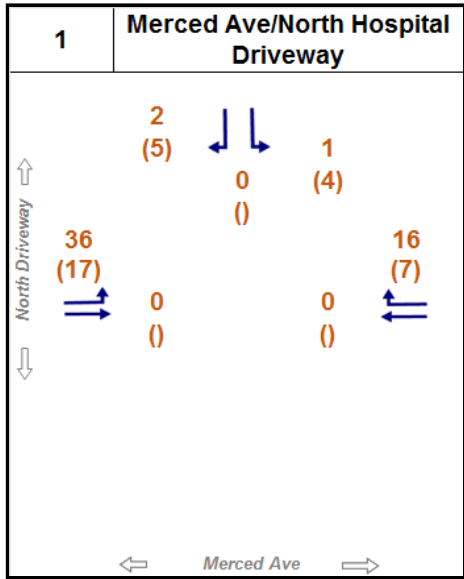


Figure 5.
Project Trip Distribution



LEGEND
 xx AM Peak Hour Traffic Volume (veh/hr)
 (xx) PM Peak Hour Traffic Volume (veh/hr)

Figure 6.
 Project Traffic Volumes

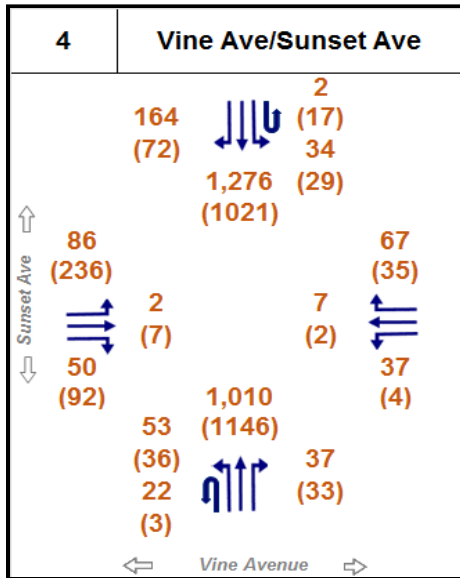
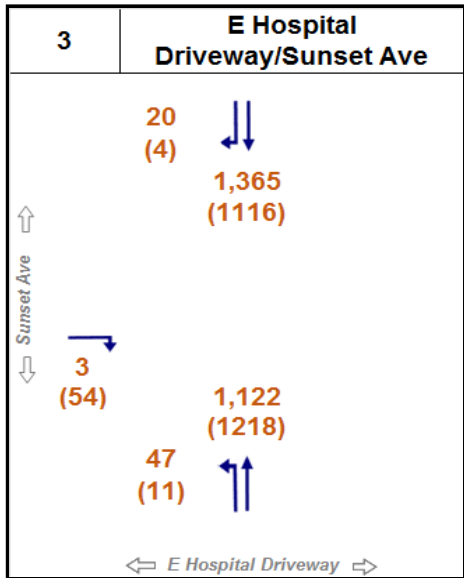
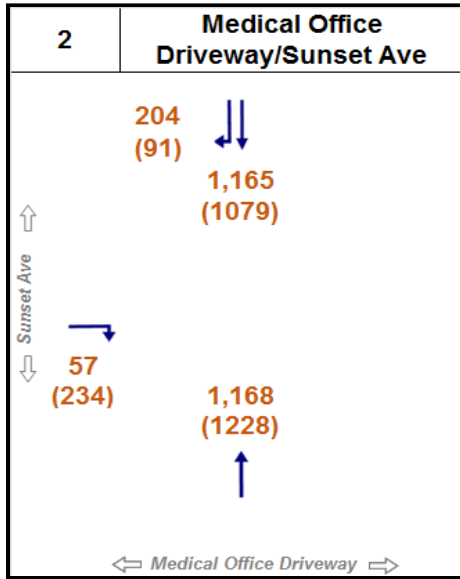
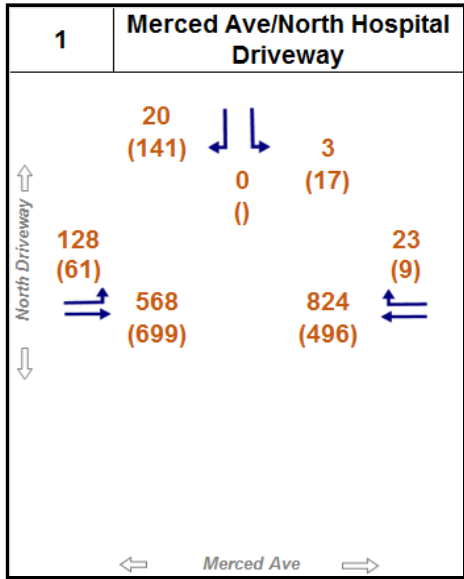
4.3. EXISTING + CUMULATIVE + PROJECT TRAFFIC VOLUMES

To estimate traffic volumes in a future year, traffic generated by cumulative growth and by the project must be considered. Future volumes with the project would generally be calculated by adding the cumulative growth and project traffic volumes. However, adjustments had to be made to account for the growth rate assumptions in the West Covina General Plan. The 1.4% annual growth rate in the General Plan included approximately 290,000 square feet (SF) of new “commercial” land uses would be in place by 2035 on the Queen of the Valley site. Details concerning the adjustments can be found in the 2019 TIS, and Table 5 shows the adjusted Project trips.

Table 5. Adjusted Project Trips

Development Type	Daily	AM		PM	
		In	Out	In	Out
Phase 1 (2022)					
New Project Trips	2,579	158	50	72	179
Estimated General Plan Trips on Project Site	-1,068	-49	-23	-40	-64
Adjusted New Site Trips at the end of Phase 1	1,512	109	27	32	115

Figure 7 shows the existing + cumulative + Project traffic volumes in 2022.



LEGEND
 xx AM Peak Hour Traffic Volume (veh/hr)
 (xx) PM Peak Hour Traffic Volume (veh/hr)

Figure 7.
 Existing + Cumulative + Project Traffic Volumes (2022)

5. SIGNIFICANT IMPACT ANALYSIS

Recall that the signalized intersections were evaluated using the ICU methodology and the unsignalized intersections were evaluated using the HCM methodology. The ICU spreadsheets and HCM reports for 2022 are included in Appendix A. Table 6 shows the resulting LOS for each of the four intersections which were previously expected to require mitigation in 2022 with the Project.

Table 6. Existing + Cumulative + Project Significant Impacts

Intersection	Existing Plus Interim Year 2022						Existing Plus Interim Year 2022 Plus Project Phases 1A and 1B						Increase in Delay (E or F only)		Increase in V/C		Significant Impact?	
	AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			AM	PM	AM	PM	AM	PM
	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS						
Cameron Ave/Sunset Ave		0.840	D		0.767	C		0.860	D		0.794	C			0.02	0.03	YES	NO
Merced Ave/Dalewood St/Garvey Ave	51.9		F	30.2		D	55.3		F	31.9		D	3.4	N/A			YES	NO
Merced Ave/California Ave		1.012	F		1.007	F		1.024	F		1.019	F			0.01	0.01	YES	YES
Cameron Ave/Orange Ave		0.889	D		0.889	D		0.900	E		0.893	D			0.01	0.00	NO	NO

As seen in the table, three of the intersections are still expected to have significant impacts with the smaller Project discussed in this report. The intersection of Cameron Avenue and Orange Avenue will no longer require mitigation at the completion of Phase 1 of the overall Queen of the Valley improvement plan.

The following list includes the recommended improvements for each of the intersections, taken directly from the 2019 TIS.

- Cameron Ave/Sunset Ave
 - Convert the outside lane on Sunset Avenue to a shared thru-right turn lane in both directions. This will require additional striping on the downstream side of the intersection in both directions and will require that parking be prohibited on Sunset Avenue in the improvement area.
- Merced Ave/Dalewood St/Garvey Ave
 - Restripe the eastbound approach to include one thru lane and one exclusive right turn lane.

- Convert intersection to a two-way stop control, with free eastbound and westbound approaches.
- Merced Ave/California Ave
 - Restripe both approaches on Merced Avenue to include one exclusive left turn lane, one thru lane, and one shared thru-right turn lane.

6. SITE DRIVEWAY ANALYSIS

6.1. QUEUING

As previously discussed, this study includes an evaluation of anticipated queuing at the project access locations to ensure that project traffic does not interfere with other traffic in the area. The anticipated 95th percentile queues were taken from *Synchro*. The 95th percentile queues are only exceeded 5% of the time and are typically used to determine turn lane storage needs. The queues for the turn lanes are shown in Table 7 along with the existing turn lane storage. The *Synchro* reports are included in Appendix B.

Table 7. 95th Percentile Queues with Project (feet)

Scenario		2022 + Project		Storage
Peak Hour		AM	PM	
Merced Ave and North Driveway	SE LT (Merced Ave)	13	5	N/A*
	SW LT-RT (Driveway)	3	25	140**
Medical Office Driveway and Sunset Ave	SW RT (Driveway)	15	95	110**
East Driveway and Sunset Ave	NE LT (Sunset Ave)	10	0	95
	SW RT (Driveway)	0	13	160**
Vine Ave and Sunset Ave	NE LT (Sunset Ave)	65	27	140
	SW LT (Sunset Ave)	27	38	140
	SE LT (Vine Ave)	44	115	125**
	SE RT (Vine Ave)	23	31	125**

*Two-Way Left Turn Lane

**Distance is to nearest driveway or turn in driveway throat

As seen in the table, all of the queues are expected to be adequately served by the existing turn lane storages. Therefore, no improvements are required.

6.2. SIGHT DISTANCE

Per the scoping agreement, the sight distance for both driveways was evaluated using the requirements in the *California Highway Design Manual*⁵. For private road (site driveway) intersections, corner sight distance applies (Table 405.1A). Sight distance requirements are shown in Figure 405.7 of the manual. The corner sight distance is longer than the stopping sight distance (Table 201.1 of the manual) for both Merced Avenue and Sunset Avenue, which both have a posted speed of 40 mph. Figure 8 shows the sight visibility triangles for all three driveways.

As seen in the figure, on-street parking should continue to be prohibited along the frontage of the Project site on Sunset Avenue from the Medical Office Driveway to Vine Avenue. The same is true for the northeast side of Merced Avenue as shown in Figure 8. The Project would not change the existing geometric design within the area. Additionally, for all three driveways, the sight distance triangles are free of objects except for an existing bus shelter; therefore, visibility would not be impeded with project implementation. Therefore, the proposed Project would not create a new significant impact pertaining to site geometry that was not previously analyzed, and no mitigation measures are required.

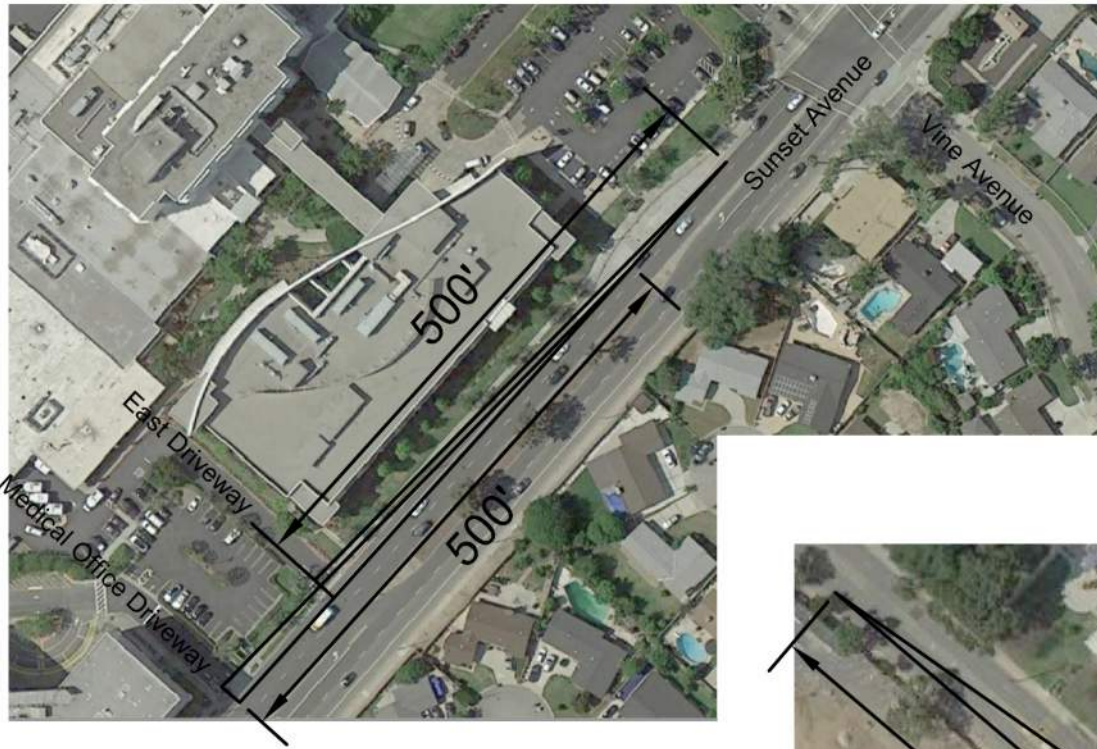


Figure 8.
Sight Visibility Triangles

7. CONSTRUCTION TRAFFIC

Although specific construction traffic volumes are not known at this time, it is expected that the construction traffic volumes will be lower than the volumes at completion of the Project. Therefore, no traffic impacts are expected from the construction traffic.

Care should be taken to ensure that construction traffic does not travel through residential areas. The project has direct access to two arterial roadways in Merced Avenue and Sunset Avenue, including signalized access at Vine Avenue and Sunset Avenue, so it is not expected that construction traffic will impact residential areas. While on-site, construction vehicles should be parked to ensure that access is available to all areas of the hospital campus without any major detours. Emergency vehicle access should also be provided at all times throughout the site.

8. FAIR SHARE CONTRIBUTION

It is anticipated that the project will contribute its fair share towards the cost of the mitigation measures listed in Section 5. The project fair share was calculated for each of the intersections requiring mitigation based on the Caltrans methodology for equitable mitigation measures, which indicates that the fair share percentage is equal to the percentage of total new trips which are generated by the project.

Table 8 shows the project fair share contribution; for instances where an intersection has impacts in both peak hours, the fair share is assumed to be an average of the two peak hour calculations. If the significant impact is only in one peak hour, the fair share contribution for the intersection is equal to the percentage calculated for the affected peak hour. The table also includes the fair share percentage that was calculated for the three intersections in the 2019 TIS for reference. As seen in the table, because the Project size has decreased and will therefore generate less traffic than originally expected, the fair share responsibility for the Project has also decreased.

Table 8. Project Fair Share Contribution

Intersection	AM Peak Hour	PM Peak Hour	Fair Share	Fair Share in 2019 TIS
Cameron Ave/Sunset Ave	27%	33%	30%	41%
Merced Ave/Dalewood St/Garvey Ave	32%	N/A	32%	43%
Merced Ave/California Ave	17%	18%	18%	25%

9. SUMMARY

This traffic study provided an evaluation of Phases 1A and 1B (Project) of the Queen of the Valley Hospital Specific Plan improvements, which were previously evaluated in the *2019 TIS*. The Project evaluated in this report is smaller in size than what was originally evaluated; therefore, the original study intersections were re-evaluated to determine where mitigation would still be required with this portion of the overall improvement plan. In addition, the site access driveways were evaluated to ensure proper turn lane storage and sight distance (unsignalized intersections only).

The Project, defined in this report as Phases 1A and 1B from the *2019 TIS*, is expected to generate 2,579 new daily trips, including 208 trips in the AM peak hour and 252 new trips in the PM peak hour. At the completion of the Project in 2022, three of the four intersections which were previously identified as needing mitigation will still require mitigation. Those intersections (and the mitigation measures) include:

- Cameron Ave/Sunset Ave
 - Convert the outside lane on Sunset Avenue to a shared thru-right turn lane in both directions. This will require additional striping on the downstream side of the intersection in both directions and will require that parking be prohibited on Sunset Avenue in the improvement area.
- Merced Ave/Dalewood St/Garvey Ave
 - Restripe the eastbound approach to include one thru lane and one exclusive right turn lane.
 - Convert intersection to a two-way stop control, with free eastbound and westbound approaches.
- Merced Ave/California Ave
 - Restripe both approaches on Merced Avenue to include one exclusive left turn lane, one thru lane, and one shared thru-right turn lane.

The evaluation also found that the existing turn lanes at the project access points are expected to serve the 95th percentile queues with the Project, so no improvements are needed. Lastly, the sight visibility triangles for the three unsignalized project access driveways are generally free of obstructions with the exception of an existing bus shelter on Merced Avenue. However, intersection geometry will not be changed with the project, and therefore, visibility would not be impeded with project implementation.

10. REFERENCES

-
- ¹ *Traffic Impact Study for Queen of the Valley Hospital Specific Plan, Environmental Impact Report.* Psomas, June 2019.
 - ² *Transportation Impact Analysis Guidelines.* Los Angeles County Public Works, July 2020.
 - ³ *Transportation Impact Study Guidelines.* City of Los Angeles Department of Transportation (LADOT), 2016
 - ⁴ *Trip Generation, 10th Edition.* Institute of Transportation Engineers (ITE). Washington, D.C., 2017.
 - ⁵ *Highway Design Manual.* California Department of Transportation, 2020.

Appendix A – ICU Spreadsheets and Synchro Reports

SE-NW Street: Cameron Ave
 NE-SW Street: Sunset Ave
 Scenario: AM Peak
 Lane Capacity: 1600
 Dual Lefts Capacity (per lane): 1440

Movement	2022 No Project				2022 + Project				PHF
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	
Southeast-bound Left	73	1	1.00	0.05	73	1	1.00	0.05	0.865
Comb. L-T		0				0			
Southeast-bound Thru	404	1	1.46	0.17	404	1	1.38	0.18	
Comb. T-R		1				1			
Southeast-bound Right	149	0	0.54	0.17	183	0	0.62	0.18	
Comb. L-T-R		0				0			
Separator									
Northwest-bound Left	237	1	1.00	0.15	243	1	1.00	0.15	0.934
Comb. L-T		0				0			
Northwest-bound Thru	765	1	1.89	0.25	765	1	1.89	0.25	
Comb. T-R		1				1			
Northwest-bound Right	44	0	0.11	0.25	44	0	0.11	0.25	
Comb. L-T-R		0				0			
Separator									
Northeast-bound Left	198	1	1.00	0.12	198	1	1.00	0.12	0.818
Comb. L-T		0				0			
Northeast-bound Thru	831	2	2.00	0.26	849	2	2.00	0.27	
Comb. T-R		0				0			
Northeast-bound Right	133	1	1.00	0.08	135	1	1.00	0.08	
Comb. L-T-R		0				0			
Separator									
Southwest-bound Left	37	1	1.00	0.02	37	1	1.00	0.02	0.845
Comb. L-T		0				0			
Southwest-bound Thru	946	2	2.00	0.30	963	2	2.00	0.30	
Comb. T-R		0				0			
Southwest-bound Right	96	1	1.00	0.06	96	1	1.00	0.06	
Comb. L-T-R		0				0			

Critical Volumes	E-W:	0.32	E-W:	0.34
	N-S:	0.42	N-S:	0.42
	Total:	0.74	Total:	0.76

Lost Time	0.10	0.10
-----------	------	------

V/C	0.840	0.860
Level of Service	D	D

HCM 6th AWSC
8: Dalewood St/Garvey Ave & Merced Ave

11/30/2020

Intersection	
Intersection Delay, s/veh	55.3
Intersection LOS	F

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	511	2	48	381	4	95
Future Vol, veh/h	511	2	48	381	4	95
Peak Hour Factor	0.90	0.90	0.83	0.83	0.87	0.87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	568	2	58	459	5	109
Number of Lanes	1	1	1	0	0	1

Approach	NW	NE	SW
Opposing Approach		SW	NE
Opposing Lanes	0	1	1
Conflicting Approach Left	NE		NW
Conflicting Lanes Left	1	0	2
Conflicting Approach Right	SW	NW	
Conflicting Lanes Right	1	2	0
HCM Control Delay	89.8	26.9	12
HCM LOS	F	D	B

Lane	NELn1	NWLn1	NWLn2	SWLn1
Vol Left, %	0%	100%	0%	4%
Vol Thru, %	11%	0%	0%	96%
Vol Right, %	89%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	429	511	2	99
LT Vol	0	511	0	4
Through Vol	48	0	0	95
RT Vol	381	0	2	0
Lane Flow Rate	517	568	2	114
Geometry Grp	2	7	7	2
Degree of Util (X)	0.788	1.086	0.003	0.214
Departure Headway (Hd)	5.789	6.888	5.669	7.103
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	631	528	634	509
Service Time	3.789	4.594	3.375	5.103
HCM Lane V/C Ratio	0.819	1.076	0.003	0.224
HCM Control Delay	26.9	90.1	8.4	12
HCM Lane LOS	D	F	A	B
HCM 95th-tile Q	7.6	17.7	0	0.8

HCM 6th AWSC
8: Dalewood St/Garvey Ave & Merced Ave

11/30/2020

Intersection	
Intersection Delay, s/veh	31.9
Intersection LOS	D

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	247	8	234	417	6	52
Future Vol, veh/h	247	8	234	417	6	52
Peak Hour Factor	0.84	0.84	0.93	0.93	0.81	0.81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	294	10	252	448	7	64
Number of Lanes	1	1	1	0	0	1

Approach	NW	NE	SW
Opposing Approach		SW	NE
Opposing Lanes	0	1	1
Conflicting Approach Left	NE		NW
Conflicting Lanes Left	1	0	2
Conflicting Approach Right	SW	NW	
Conflicting Lanes Right	1	2	0
HCM Control Delay	18.3	40.1	9.9
HCM LOS	C	E	A

Lane	NELn1	NWLn1	NWLn2	SWLn1
Vol Left, %	0%	100%	0%	10%
Vol Thru, %	36%	0%	0%	90%
Vol Right, %	64%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	651	247	8	58
LT Vol	0	247	0	6
Through Vol	234	0	0	52
RT Vol	417	0	8	0
Lane Flow Rate	700	294	10	72
Geometry Grp	2	7	7	2
Degree of Util (X)	0.933	0.57	0.015	0.12
Departure Headway (Hd)	4.8	6.984	5.765	6.032
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	763	518	619	591
Service Time	2.8	4.733	3.513	4.099
HCM Lane V/C Ratio	0.917	0.568	0.016	0.122
HCM Control Delay	40.1	18.6	8.6	9.9
HCM Lane LOS	E	C	A	A
HCM 95th-tile Q	13.4	3.5	0	0.4

SE-NW Street: Cameron Ave
 NE-SW Street: Sunset Ave
 Scenario: PM Peak
 Lane Capacity: 1600
 Dual Lefts Capacity (per lane): 1440

Movement	2022 No Project				2022 + Project				PHF
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	
Southeast-bound Left	150	1	1.00	0.09	150	1	1.00	0.09	0.853
Comb. L-T		0				0			
Southeast-bound Thru	626	1	1.56	0.25	626	1	1.54	0.25	
Comb. T-R		1				1			
Southeast-bound Right	177	0	0.44	0.25	187	0	0.46	0.25	0.941
Comb. L-T-R		0				0			
Northwest-bound Left	104	1	1.00	0.07	106	1	1.00	0.07	
Comb. L-T		0				0			
Northwest-bound Thru	450	1	1.78	0.16	450	1	1.78	0.16	0.909
Comb. T-R		1				1			
Northwest-bound Right	55	0	0.22	0.16	55	0	0.22	0.16	
Comb. L-T-R		0				0			
Northeast-bound Left	172	1	1.00	0.11	172	1	1.00	0.11	0.879
Comb. L-T		0				0			
Northeast-bound Thru	982	2	2.00	0.31	1059	2	2.00	0.33	
Comb. T-R		0				0			
Northeast-bound Right	141	1	1.00	0.09	147	1	1.00	0.09	0.879
Comb. L-T-R		0				0			
Southwest-bound Left	69	1	1.00	0.04	69	1	1.00	0.04	
Comb. L-T		0				0			
Southwest-bound Thru	778	2	2.00	0.24	783	2	2.00	0.24	0.879
Comb. T-R		0				0			
Southwest-bound Right	53	1	1.00	0.03	53	1	1.00	0.03	
Comb. L-T-R		0				0			

Critical Volumes	E-W:	0.32	E-W:	0.32
	N-S:	0.35	N-S:	0.37
	Total:	0.67	Total:	0.69

Lost Time	0.10	0.10
-----------	------	------

V/C	0.767	0.794
Level of Service	C	C

SE-NW Street: Merced Ave
 NE-SW Street: California Ave
 Scenario: AM Peak
 Lane Capacity: 1600
 Dual Lefts Capacity (per lane): 1440

Movement	2022 No Project				2022 + Project				PHF
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	
Southeast-bound Left Comb. L-T	70	0	0.14	0.32	70	0	0.14	0.32	0.816
Southeast-bound Thru Comb. T-R	435	1	1.86	0.15	440	1	1.86	0.15	
Southeast-bound Right Comb. L-T-R	44	1	1.00	0.03	44	1	1.00	0.03	
		0				0			
Northwest-bound Left Comb. L-T	78	0	0.10	0.48	78	0	0.10	0.49	0.827
Northwest-bound Thru Comb. T-R	690	1	1.90	0.23	707	1	1.90	0.23	
Northwest-bound Right Comb. L-T-R	39	1	1.00	0.02	39	1	1.00	0.02	
		0				0			
Northeast-bound Left Comb. L-T	29	0	0.13	0.14	29	0	0.13	0.14	0.697
Northeast-bound Thru Comb. T-R	188	0	0.87	0.14	188	0	0.87	0.14	
Northeast-bound Right Comb. L-T-R	63	1	1.00	0.04	63	1	1.00	0.04	
		0				0			
Southwest-bound Left Comb. L-T	44	0	0.18	0.15	44	0	0.18	0.15	0.700
Southwest-bound Thru Comb. T-R	196	0	0.82	0.15	196	0	0.82	0.15	
Southwest-bound Right Comb. L-T-R	71	1	1.00	0.04	71	1	1.00	0.04	
		0				0			

Critical Volumes	E-W:	0.63	E-W:	0.64
	N-S:	0.29	N-S:	0.29
	Total:	0.91	Total:	0.92

Lost Time	0.10	0.10
-----------	------	------

V/C	1.012	1.024
Level of Service	F	F

SE-NW Street: Merced Ave
 NE-SW Street: California Ave
 Scenario: PM Peak
 Lane Capacity: 1600
 Dual Lefts Capacity (per lane): 1440

Movement	2022 No Project				2022 + Project				PHF
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	
Southeast-bound Left Comb. L-T	80	0	0.11	0.44	80	0	0.11	0.45	0.895
Southeast-bound Thru Comb. T-R	627	1	1.89	0.21	644	1	1.89	0.21	
Southeast-bound Right Comb. L-T-R	31	1	1.00	0.02	31	1	1.00	0.02	
		0				0			
Northwest-bound Left Comb. L-T	45	0	0.10	0.27	45	0	0.10	0.27	0.926
Northwest-bound Thru Comb. T-R	385	1	1.90	0.13	390	1	1.90	0.13	
Northwest-bound Right Comb. L-T-R	48	1	1.00	0.03	48	1	1.00	0.03	
		0				0			
Northeast-bound Left Comb. L-T	29	0	0.11	0.17	29	0	0.11	0.17	0.942
Northeast-bound Thru Comb. T-R	246	0	0.89	0.17	246	0	0.89	0.17	
Northeast-bound Right Comb. L-T-R	52	1	1.00	0.03	52	1	1.00	0.03	
		0				0			
Southwest-bound Left Comb. L-T	39	0	0.15	0.17	39	0	0.15	0.17	0.790
Southwest-bound Thru Comb. T-R	227	0	0.85	0.17	227	0	0.85	0.17	
Southwest-bound Right Comb. L-T-R	48	1	1.00	0.03	48	1	1.00	0.03	
		0				0			

Critical Volumes	E-W:	0.57	E-W:	0.58
	N-S:	0.34	N-S:	0.34
	Total:	0.91	Total:	0.92

Lost Time	0.10	0.10
-----------	------	------

V/C	1.007	1.019
Level of Service	F	F

SE-NW Street: Cameron Ave
 NE-SW Street: Orange Ave
 Scenario: AM Peak
 Lane Capacity: 1600
 Dual Lefts Capacity (per lane): 1440

Movement	2022 No Project				2022 + Project				PHF
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	
Southeast-bound Left	8	1	1.00	0.01	8	1	1.00	0.01	0.842
Comb. L-T		0				0			
Southeast-bound Thru	433	1	1.15	0.24	435	1	1.15	0.24	
Comb. T-R		1				1			
Southeast-bound Right	320	0	0.85	0.24	320	0	0.85	0.24	
Comb. L-T-R		0				0			
Separator									
Northwest-bound Left	328	1	1.00	0.21	328	1	1.00	0.21	0.839
Comb. L-T		0				0			
Northwest-bound Thru	670	1	1.97	0.21	670	1	1.97	0.21	
Comb. T-R		1				1			
Northwest-bound Right	10	0	0.03	0.21	10	0	0.03	0.21	
Comb. L-T-R		0				0			
Separator									
Northeast-bound Left	357	0	0.96	0.23	357	0	0.96	0.23	0.854
Comb. L-T		1				1			
Northeast-bound Thru	15	0	0.04	0.23	15	0	0.04	0.23	
Comb. T-R		0				0			
Northeast-bound Right	343	1	1.00	0.21	343	1	1.00	0.21	
Comb. L-T-R		0				0			
Separator									
Southwest-bound Left	106	0	0.57	0.12	123	0	0.61	0.13	0.830
Comb. L-T		1				1			
Southwest-bound Thru	80	0	0.43	0.12	80	0	0.39	0.13	
Comb. T-R		0				0			
Southwest-bound Right	56	1	1.00	0.04	56	1	1.00	0.04	
Comb. L-T-R		0				0			

Critical Volumes	E-W:	0.44	E-W:	0.44
	N-S:	0.35	N-S:	0.36
	Total:	0.79	Total:	0.80

Lost Time	0.10	0.10
-----------	------	------

V/C	0.889	0.900
Level of Service	D	E

SE-NW Street: Cameron Ave
 NE-SW Street: Orange Ave
 Scenario: PM Peak
 Lane Capacity: 1600
 Dual Lefts Capacity (per lane): 1440

Movement	2022 No Project				2022 + Project				PHF
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	
Southeast-bound Left	7	1	1.00	0.00	7	1	1.00	0.00	0.937
Comb. L-T		0				0			
Southeast-bound Thru	495	1	1.38	0.22	495	1	1.38	0.22	
Comb. T-R		1				1			
Southeast-bound Right	223	0	0.62	0.22	223	0	0.62	0.22	
Comb. L-T-R		0				0			
Northwest-bound Left	351	1	1.00	0.22	351	1	1.00	0.22	0.952
Comb. L-T		0				0			
Northwest-bound Thru	551	1	1.99	0.17	551	1	1.99	0.17	
Comb. T-R		1				1			
Northwest-bound Right	4	0	0.01	0.17	4	0	0.01	0.17	
Comb. L-T-R		0				0			
Northeast-bound Left	329	0	0.96	0.22	329	0	0.96	0.22	0.924
Comb. L-T		1				1			
Northeast-bound Thru	15	0	0.04	0.22	15	0	0.04	0.22	
Comb. T-R		0				0			
Northeast-bound Right	426	1	1.00	0.27	426	1	1.00	0.27	
Comb. L-T-R		0				0			
Southwest-bound Left	75	0	0.59	0.08	80	0	0.61	0.08	0.838
Comb. L-T		1				1			
Southwest-bound Thru	52	0	0.41	0.08	52	0	0.39	0.08	
Comb. T-R		0				0			
Southwest-bound Right	64	1	1.00	0.04	64	1	1.00	0.04	
Comb. L-T-R		0				0			

Critical Volumes	E-W:	0.44	E-W:	0.44
	N-S:	0.35	N-S:	0.35
	Total:	0.79	Total:	0.79

Lost Time	0.10	0.10
-----------	------	------

V/C	0.889	0.893
Level of Service	D	D

Appendix B – Synchro Reports for Site Access Points

Intersection

Int Delay, s/veh 0.9

Movement SEL SET NWT NWR SWL SWR

Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	103	568	824	12	2	19
Future Vol, veh/h	103	568	824	12	2	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage,-#	0	0	-	0	-	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	112	617	896	13	2	21

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	909	0	-	0	1436	455
Stage 1	-	-	-	-	903	-
Stage 2	-	-	-	-	533	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	745	-	-	-	124	552
Stage 1	-	-	-	-	356	-
Stage 2	-	-	-	-	553	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	745	-	-	-	105	552
Mov Cap-2 Maneuver	-	-	-	-	210	-
Stage 1	-	-	-	-	303	-
Stage 2	-	-	-	-	553	-

Approach SE NW SW

HCM Control Delay, s	6	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt NWT NWR SEL SE\$WLn1

Capacity (veh/h)	-	-	745	-	478
HCM Lane V/C Ratio	-	-	0.15	-	0.048
HCM Control Delay (s)	-	-	10.7	-	12.9
HCM Lane LOS	-	-	B	-	B
HCM 95th %tile Q(veh)	-	-	0.5	-	0.1

Intersection

Int Delay, s/veh 0.4

Movement SEL SER NEL NET SWT SWR

Lane Configurations		↗		↑↑	↑↑	
Traffic Vol, veh/h	0	57	0	1151	1158	204
Future Vol, veh/h	0	57	0	1151	1158	204
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage0#	-	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	62	0	1251	1259	222

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	-	741	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	359	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	359	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach SE NE SW

HCM Control Delay, s	17.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt NETSELn1 SWT SWR

Capacity (veh/h)	-	359	-	-
HCM Lane V/C Ratio	-	0.173	-	-
HCM Control Delay (s)	-	17.1	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.6	-	-

Intersection

Int Delay, s/veh 0.3

Movement SEL SER NEL NET SWT SWR

Lane Configurations		↗	↘	↑↑	↑↑	
Traffic Vol, veh/h	0	3	47	1105	1358	20
Future Vol, veh/h	0	3	47	1105	1358	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	95	-	-	-
Veh in Median Storage0#	-	-	0	0	-	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	3	51	1201	1476	22

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	-	749	1498	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	4.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	0	354	444	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	354	444	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach SE NE SW

HCM Control Delay, s	5.3	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt NEL NETSELn1 SWT SWR

Capacity (veh/h)	444	-	354	-	-
HCM Lane V/C Ratio	0.115	-	0.009	-	-
HCM Control Delay (s)	14.2	-	15.3	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.4	-	0	-	-

Queues

5: Sunset Ave & Vine Ave

11/29/2020



Lane Group	SET	SER	NWT	NWR	NEL	NET	SWL	SWT
Lane Group Flow (vph)	75	47	48	73	63	1138	39	1503
v/c Ratio	0.15	0.08	0.09	0.12	0.50	0.65	0.26	0.86
Control Delay	14.9	8.6	14.1	6.2	27.4	12.9	13.8	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	8.6	14.1	6.2	27.4	12.9	13.8	19.2
Queue Length 50th (ft)	19	5	12	3	14	143	7	222
Queue Length 95th (ft)	44	23	31	26	#65	200	27	#317
Internal Link Dist (ft)	124		127			544		445
Turn Bay Length (ft)					140		140	
Base Capacity (vph)	484	569	518	591	132	1832	157	1824
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.08	0.09	0.12	0.48	0.62	0.25	0.82

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection

Int Delay, s/veh 1.7

Movement SEL SET NWT NWR SWL SWR

Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	53	699	496	6	16	139
Future Vol, veh/h	53	699	496	6	16	139
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage,-#	0	0	-	0	-	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	760	539	7	17	151

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	546	0	-	0	1039	273
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	496	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1019	-	-	-	226	725
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	577	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1019	-	-	-	213	725
Mov Cap-2 Maneuver	-	-	-	-	333	-
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	577	-

Approach SE NW SW

HCM Control Delay, s	0.6	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt NWT NWR SEL SE\$WLn1

Capacity (veh/h)	-	-	1019	-	646
HCM Lane V/C Ratio	-	-	0.057	-	0.261
HCM Control Delay (s)	-	-	8.7	-	12.5
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.2	-	1

Intersection

Int Delay, s/veh 2.3

Movement SEL SER NEL NET SWT SWR

Lane Configurations		↗		↑↑	↑↑	
Traffic Vol, veh/h	0	234	0	1223	1063	91
Future Vol, veh/h	0	234	0	1223	1063	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage0#	-	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	254	0	1329	1155	99

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	-	627	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	426	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	426	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach SE NE SW

HCM Control Delay, s	25.2	0	0
HCM LOS	D		

Minor Lane/Major Mvmt NETSELn1 SWT SWR

Capacity (veh/h)	-	426	-	-
HCM Lane V/C Ratio	-	0.597	-	-
HCM Control Delay (s)	-	25.2	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	3.8	-	-

Intersection

Int Delay, s/veh 0.4

Movement SEL SER NEL NET SWT SWR

Lane Configurations		↗	↘	↑↑	↑↑	
Traffic Vol, veh/h	0	54	11	1213	1100	4
Future Vol, veh/h	0	54	11	1213	1100	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	95	-	-	-
Veh in Median Storage0#	-	-	0	0	-	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	59	12	1318	1196	4

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	-	600	1200	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	4.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	0	444	577	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	444	577	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach SE NE SW

HCM Control Delay, s 4.3 0.1 0
HCM LOS B

Minor Lane/Major Mvmt NEL NETSELn1 SWT SWR

Capacity (veh/h)	577	-	444	-	-
HCM Lane V/C Ratio	0.021	-	0.132	-	-
HCM Control Delay (s)	11.4	-	14.3	-	-
HCM Lane LOS	B	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

Queues

5: Sunset Ave & Vine Ave

11/29/2020



Lane Group	SET	SER	NWT	NWR	NEL	NET	SWL	SWT
Lane Group Flow (vph)	216	83	6	38	37	1282	50	1170
v/c Ratio	0.44	0.14	0.01	0.06	0.28	0.76	0.38	0.70
Control Delay	18.3	7.1	13.2	5.7	15.3	15.5	19.2	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	7.1	13.2	5.7	15.3	15.5	19.2	13.9
Queue Length 50th (ft)	58	6	1	0	7	172	10	148
Queue Length 95th (ft)	115	31	8	16	27	240	38	208
Internal Link Dist (ft)	124		127			544		445
Turn Bay Length (ft)					140		140	
Base Capacity (vph)	494	612	598	599	149	1910	149	1905
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.14	0.01	0.06	0.25	0.67	0.34	0.61

Intersection Summary



Balancing the Natural and Built Environment

www.Psomas.com