IV.L TRANSPORTATION AND CIRCULATION

1. Introduction

The purpose of this section is to assess the potential future traffic and circulation impacts resulting from the development of a new planned community in the New Model Colony (NMC) area of the City of Ontario (City) through the implementation of a specific plan. It also identifies the traffic mitigation measures necessary to maintain the established level of service standards for the elements of the impacted roadway system in compliance with the San Bernardino County Congestion Management Program (CMP) and the City standards.

The discussion of impacts presented in this section is based on the analysis contained in the Grand Park Specific Plan Traffic Impact Analysis (TIA) performed by Iteris, Inc. in February 2013, and correspondence received from the State Department of Transportation Caltrans and Omnitrans. The TIA is located in Appendix J and the correspondence is located in Appendix A-3. The scope of the TIA was developed by Iteris, Inc. in consultation with City transportation and planning staffs. The TIA is intended to quantify and analyze the potential future traffic and circulation impacts associated with project-generated traffic on the street system within the area surrounding the project site during both the AM and PM peak hours.

2. Environmental Setting

a) Existing Conditions

Iteris, Inc. conducted several site visits in order to thoroughly assess existing conditions at the project site and within the study area. The field inventory included review of existing intersection geometric layout, traffic control, lane configurations, posted speed limits, transit service, land use, and parking. This information is required for subsequent traffic impact analysis.

Thirteen intersections identified below were selected in consultation with City staff for the level of service (LOS) analysis. They represent the locations that may potentially be impacted by traffic due to the proposed project. Refer to Figure IV.L-1, Study Area Intersections below for a graphical depiction of the study area intersections.

- Archibald Avenue / SR-60 West Bound Ramps (existing)
- Archibald Avenue / SR-60 East Bound Ramps (existing)
- Archibald Avenue / Schaeffer Avenue (existing)
- Archibald Avenue / Park Street (future)
- Archibald Avenue / Eucalyptus Avenue (existing)

- "A" Street / Edison Avenue (future)
- Turner Avenue / Edison Avenue (future)
- Haven Avenue / Schaeffer Avenue (future)
- Haven Avenue / Park Street (future)
- Haven Avenue / Eucalyptus Avenue (future)
- "A" Street / Park Street (future)
- Turner Avenue / Park Street (future)
- "B" Street / Park Street (future)

1) Description of Existing Study Area Intersections

Archibald Avenue and SR 60 WB Ramps is controlled by a 6-phase traffic signal with protected left-turn phasing for Archibald Avenue and the SR 60 WB Off-Ramp. The northbound approach is striped as an exclusive left-turn lane and three through lanes. The southbound approach is striped as three through lanes and a shared through/right-turn lane. The westbound approach is striped as a shared left-turn/through lane and an exclusive right-turn lane.

Archibald Avenue and SR 60 EB Ramps is controlled by a 6-phase traffic signal with protected left-turn phasing for Archibald Avenue and the SR-60 EB Off-Ramp. The northbound approach is striped as three through lanes and a shared through/right-turn lane. The southbound approach is striped as an exclusive left-turn lane and three through lanes. The eastbound approach is striped as a shared left-turn/through lane and an exclusive right-turn lane.

Archibald Avenue and Schaefer Avenue is a two-way stop controlled intersection in the east-west direction. The northbound and southbound approaches are striped as an exclusive left turn lane and a shared through/right-turn lane. The eastbound and westbound approaches have one lane in each direction.

Archibald Avenue and Eucalyptus Avenue is a T intersection and is stop controlled in the westbound direction. The northbound approach has one shared through/right-turn lane. The southbound approach has an exclusive left-turn lane and a through lane. The westbound approach has one lane in each direction.

2) Description of Planned Improvements

San Bernardino Associated Governments Measure I

Measure I is the half-cent sales tax collected throughout San Bernardino County for transportation improvements. San Bernardino County voters first approved the measure in November 1989 to ensure that needed transportation projects were implemented countywide through 2010. In 2004, San Bernardino County voters overwhelmingly approved the

extension of the Measure I sales tax, with 80.03% voting to extend the measure through 2040. San Bernardino Associated Governments (SANBAG) administers Measure I revenue and is responsible for determining which projects receive Measure I funding, and ensuring that transportation projects are implemented. Measure I funds are allocated based on a strategic plan.

SANBAG serves as the Congestion Management Agency for San Bernardino County. The SANBAG Board of Directors approved the Strategic Plan on April 1, 2009. The Strategic Plan is the reference manual and policy document for the administration of Measure I 2010-2040 programs by SANBAG and its member agencies.

SANBAG Board approved modifications to the Congestion Management Program (CMP) to incorporate these provisions for the urbanized areas of the County, which includes the City in November, 2005. The SANBAG Development Mitigation Program adopted into the CMP includes the Land Use/Transportation Analysis Program, Development Mitigation Nexus Study and the development mitigation implementation language. Jurisdictions in the San Bernardino Valley and Victor Valley, which includes the City, subsequently approved the creation or update of Development Impact Fee (DIF) programs that include mitigation for improvements to freeway interchanges, rail/highway grade separations, and arterial streets on the regional network.

The Congestion Management Program (CMP) defines a network of state highways and arterials, level of service standards and related procedures, a process for mitigation of the impacts of new development on the transportation system, and technical justification for the approach. The policies and technical information contained in this document are subject to ongoing review, with updates required each two years, at a minimum.

The SANBAG Nexus Study identifies the fair share contributions from new development for regional transportation improvements (freeway interchanges, railroad grade separations, and regional arterial highways). The Nexus Study is updated biennially or as requested and in close coordination with local jurisdictions. The Nexus Study identifies specific improvement projects on the Nexus Study Network and includes a cost estimate for the projects. The cost estimates have been developed collaboratively, working with local jurisdictions to obtain the most up-to-date project cost data available. Costs may include planning, project development (including Project Study Reports, Project Reports, and environmental documents), design, construction, construction management, project management, right-of-way, and mitigation of impacts subject to the policy provisions contained in the Measure I Strategic Plan. Only those project phases for which costs are included in the Nexus Study are eligible for Measure I or other transportation funding allocated by SANBAG.

The Nexus Study does not dictate how local jurisdictions develop and implement their development mitigation programs to achieve the development contribution levels specified in this report. Local jurisdictions have substantial flexibility in their program approach. In addition, the SANBAG Nexus Study does not dictate per-unit contribution levels (or development fees) by land use type. Each jurisdiction must develop its own schedule of fees or other per-unit

mitigation levels that can be demonstrated to achieve the development contribution levels specified in this Nexus Study by facility type. Appendix J of the CMP also indicates that cities and the County may make arrangements to combine the required development contribution levels for each jurisdiction and its sphere and to develop a unified development mitigation program for the city and the sphere. For example, if a city is using a Development Impact Fee (DIF) program to meet the SANBAG requirements, a common fee structure for the city and sphere could be established. The city and County would need to establish the appropriate legal agreements and administrative processes to manage such a joint program. The information in the SANBAG Nexus Study allows for either separate or joint city/County programs. If a joint program is pursued, the city and County would add the development contribution levels for the both the city and sphere area.

Table 3 of the Nexus Study identifies the Archibald Avenue/SR-60 interchange for improvements. The proposed mitigation measures (refer to Section 4, Mitigation Measures below) necessary to reduce potentially significant impacts associated with the proposed project below the level of significance would be completed as part of this interchange improvement project. The project's contribution to these improvements would be determined according to the City's New Model Colony Development Impact Fees, revised on February 11, 2013.

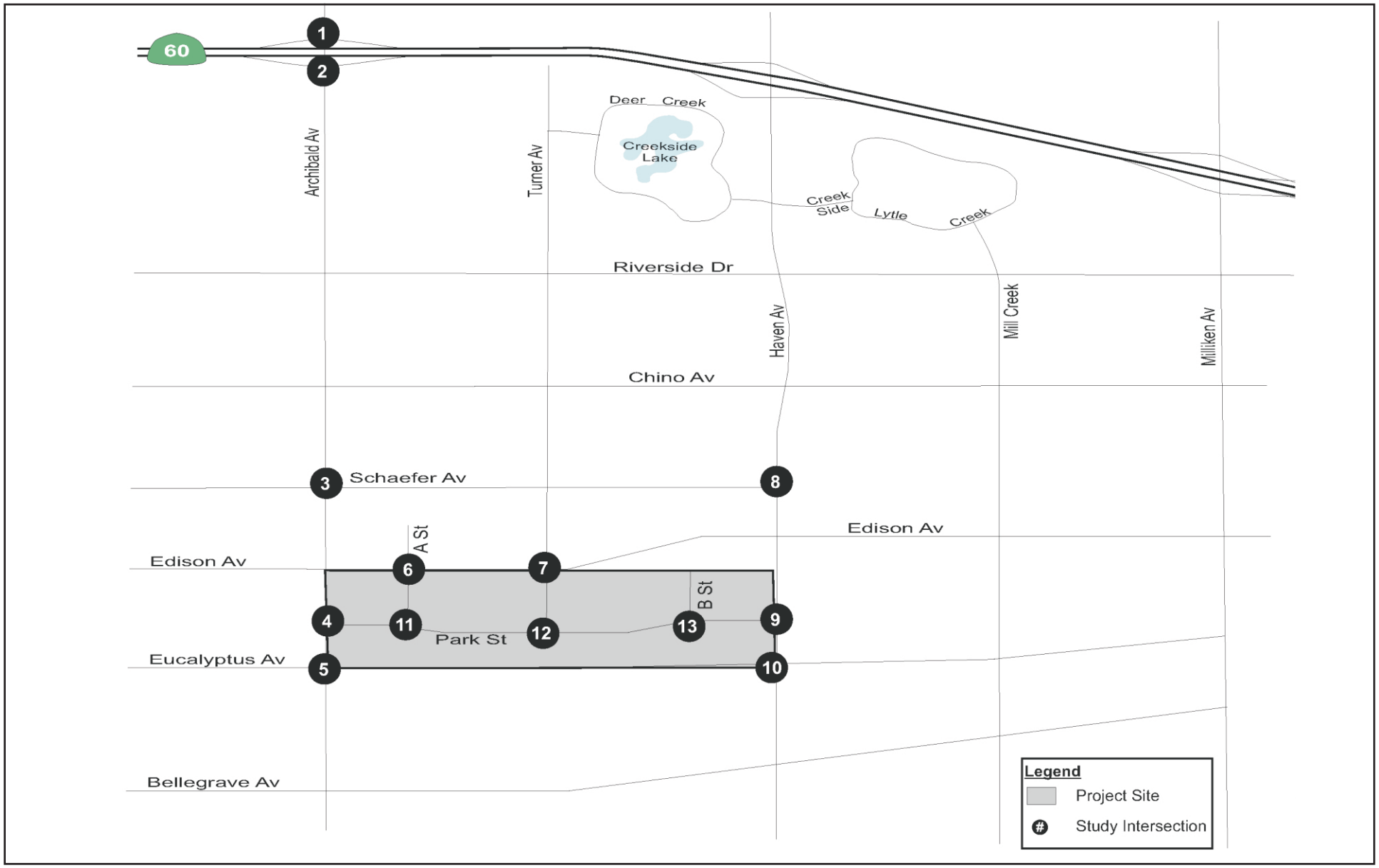
City of Ontario Master Plan of Streets and Highways

The City's Master Plan of Streets and Highways, approved on September 7, 2011, classifies the following roadways adjacent to the project site below:

- Archibald Avenue - Other Principal Arterial
- Edison Avenue - Other Principal Arterial
- Haven Avenue - Other Principal Arterial
- Eucalyptus Avenue - Collector Street

3) Existing Traffic Volumes

Turning movement counts were performed during the AM and PM peak periods at four (existing) of the thirteen study area intersections, which are provided in Appendix A of the TIA. Figure IV.L-2 illustrates the existing AM and PM peak hour turning movement volumes at the existing study area intersections.



Source: Iteris, July 2008.

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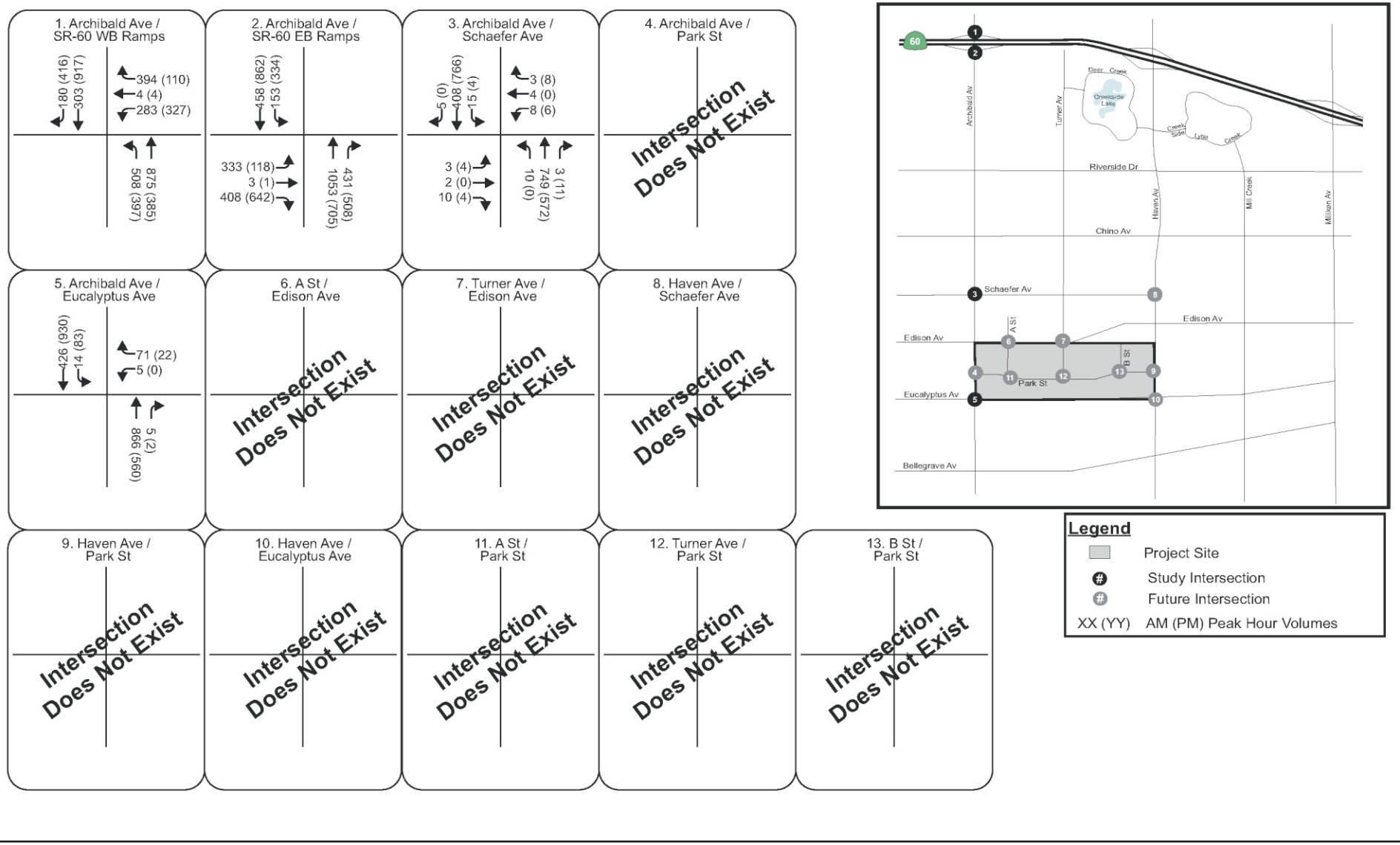
Figure IV.L-1
Study Intersections



Source: Iteris, February 2013.

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Figure IV.L-2
Existing (2012) AM (PM) Peak Hour Volumes

4) Description of Existing Road Network

The following describes existing conditions at the major roadways within the study area.

Edison Avenue is an east-west arterial located north of the project site. Edison Avenue has two travel lanes throughout the study area.

Archibald Avenue is a north-south arterial located west of the project site. Archibald Avenue has two travel lanes in the study area.

Haven Avenue is a north-south arterial located east of the project site. Haven Avenue is currently unimproved in the study area.

Eucalyptus (future Merrill) Avenue is an east-west arterial located south of the project site. Eucalyptus Avenue has two travel lanes in the study area.

5) Existing Transit Services

Omnitrans, the public agency serving San Bernardino Valley, operates one line through the study area.

Route 81 - Ontario - Ontario Mills-Chaffey College: Route 81 travels mainly along Campus Avenue, Francis Avenue, Vineyard Avenue, Riverside Drive, Haven Avenue, Milliken Avenue, and Foothill Boulevard. Popular destinations along this route include the Ontario Civic Center, the Ontario Mills Mall, East Ontario, and Rancho Cucamonga Metrolink stations, the Victoria Gardens, and the Chaffey College. This route operates from Monday through Friday with headway of 60 minutes with the closest stop located approximately three miles north of the project site along Riverside Drive.

6) Existing Traffic Operations Analysis

The morning and evening peak hour level of service analyses were conducted at the four existing study area intersections based on the existing traffic volume counts and the methodologies described previously. The level of service analysis was performed using TRAFFIX software for signalized intersections using the HCM 2000 Operations Methodology.

The TIA evaluated the levels of service at the study area intersections under existing conditions during the AM and PM peak hours. Level of service calculation worksheets are included in Appendix C of the TIA. Results show that all four existing intersections are currently operating at acceptable levels of service during both AM and PM peak hours. The Archibald Avenue / SR-60 West Bound and East Bound Ramps are operating at LOS C during the AM and PM peak-hour periods. The Archibald Avenue / Schaeffer Avenue intersection is operating at LOS Deliverable during the AM and PM peak-hour periods. The Archibald Avenue / Eucalyptus Avenue intersection is operating at LOS C during the AM peak-hour and LOS Billing during the PM peak-hour.

7) 2030 Traffic Forecast Model Development

The 2030 With Project traffic volumes for the project were developed using TOP model. The travel demand model was developed by Kimley-Horn and Associates, Inc. during the General Plan Update for the City. It is a focused model based on the Ontario Airport Ground Access Model and the Southern California Association of Governments (SCAG) Riverside-San Bernardino (RIVSAN) Comprehensive Transportation Plan (CTP) traffic model. The land use data for the TAZs that represent the proposed project (TAZ 226, 227) were updated based on the Specific Plan land use data described previously. After the TAZs were updated, model run was conducted and the resulting trip estimates were further refined to reflect the anticipated trips from the Specific Plan, as shown in Table 2. Typically, a post-processing of the model generated traffic volumes based on existing traffic trends would be performed. However, due to the existing rural setting and the magnitude of the planned development in the area, the existing traffic circulation is expected to change dramatically, and therefore, the current traffic movement patterns cannot be used as the basis for future traffic volume adjustments. The horizon year (2030) turning movement volumes obtained directly from the TOP model were used for intersection level of service analysis.

The 2030 No Project traffic volumes were calculated by subtracting the Project Only peak hour volumes from the 2030 With Project peak hour traffic volumes at the study area intersections. This will serve as the basis for estimating impacts of the proposed project on background conditions for the year 2030.

b) Development of Traffic Volumes

1) Existing Traffic Volumes

AM and PM peak period turning movement counts were conducted at the four existing study area intersections in July 2012. Detailed vehicle turning movement data are included in Appendix A of the TIA. Vehicle classification counts (e.g., passenger vehicle, 2-axle truck, 3-axle truck, and 4 or more axle truck), were conducted at four of the thirteen study intersections. The traffic counts at these four intersections were converted to passenger car equivalent (PCE) volumes using PCE factors of 1.5, 2.0, and 3.0 for 2-axle, 3-axle, and 4 or more axle trucks, respectively. Volume development worksheets are included in the TIA. Refer to Figure IV.L-2 above for the existing peak hour volumes at the study area intersections.

2) Existing Plus Project Traffic Volumes

The project proposes to develop up to 1,327 dwelling units of residential, a high school with 2,500 students, an elementary school with 800 students, and a 131-net acre park. The proposed development will generate additional traffic. The trip generation calculations for this project were based on rates published in the Institute of Transportation Engineer's (ITE) Trip Generation, 8th Edition. ITE trip generation rates and the trip generation calculations for the project are provided in the TIA.

The directional distribution of the new trips generated by the project was developed using the "select zone" run of the City's The Ontario Plan (TOP) model for the traffic analysis zone (TAZ) that represents the project (TAZ 226). Figure IV.L-3 illustrates the project trip distribution. Trip assignment is the product of trip generation multiplied by the trip distribution percentages. The assignment of new project trips at each of the study area intersections during the weekday AM and PM peak hours is illustrated in Figure IV.L-4.

To develop Existing Plus Project traffic volumes, trips generated by the proposed project were added to the existing traffic volumes at the study area intersections. Volume development worksheets are included in Appendix B of the TIA. Figure IV.L-5 shows the existing plus project peak hour volumes at the study area intersections.

3. Project Impacts

a. Analysis Methodology

Prior to commencing work on the TIA, coordination meetings were held with City staff as part of the scoping process to finalize the traffic study parameters and methodology. The CMP allows an intersection to operate at LOS E; however, the City requires a more stringent LOS D. In this analysis, minimum acceptable intersection operating conditions will follow the City guidelines for all intersections. Intersections operating at LOS E or F are considered unsatisfactory.

Traffic operations in the project vicinity were analyzed, as directed by the City staff, using the Highway Capacity Manual (HCM) methodology, as described in the Highway Capacity Manual, HCM 2000 (Transportation Research Board, Washington, D.C., 2000.).

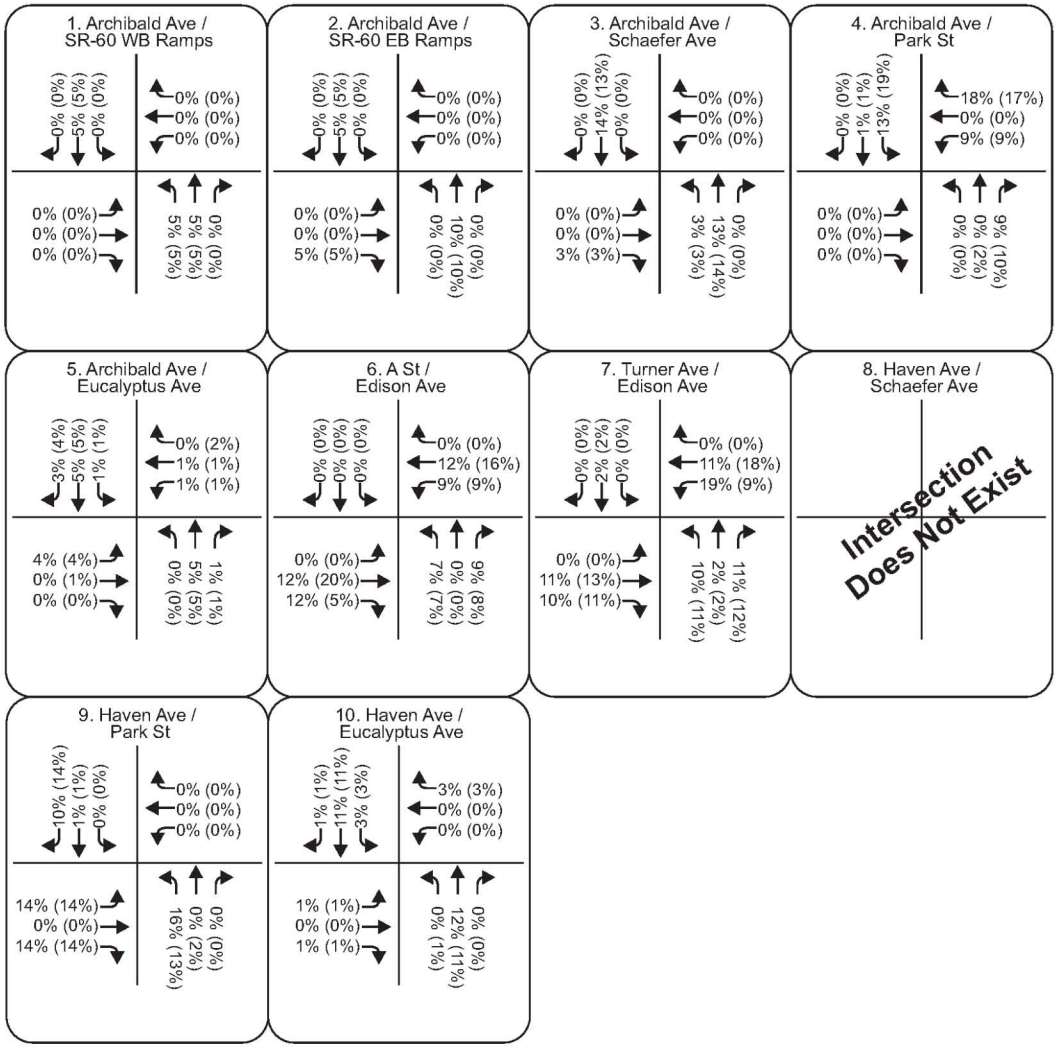
The efficiency of traffic operations at a location is measured in terms of level of service (LOS). Table IV.L-1 below provides level of service definitions. Level of service is a description of traffic performance at intersections. The level of service concept is a measure of the average operating conditions at an intersection during an hour. It is based on vehicle-delay and is defined by a range of grades ranging from A to F. LOS A represents free-flow conditions where little or no delay is experienced at the intersection. LOS F characterizes extremely unstable flow conditions and severe congestion with volumes at or near the designed capacity. At LOS F, vehicles are likely to experience major delays crossing an intersection. Minor incidents may lead to forced-flow conditions (LOS F) with operating traffic flows substantially below capacity, which may result in long queues backing up from all approaches to intersections. This analysis incorporates the effects of the lane geometry and signal phasing (i.e. protected or permitted left turns) to produce the results described by the level of service scale indicated by delay and LOS.

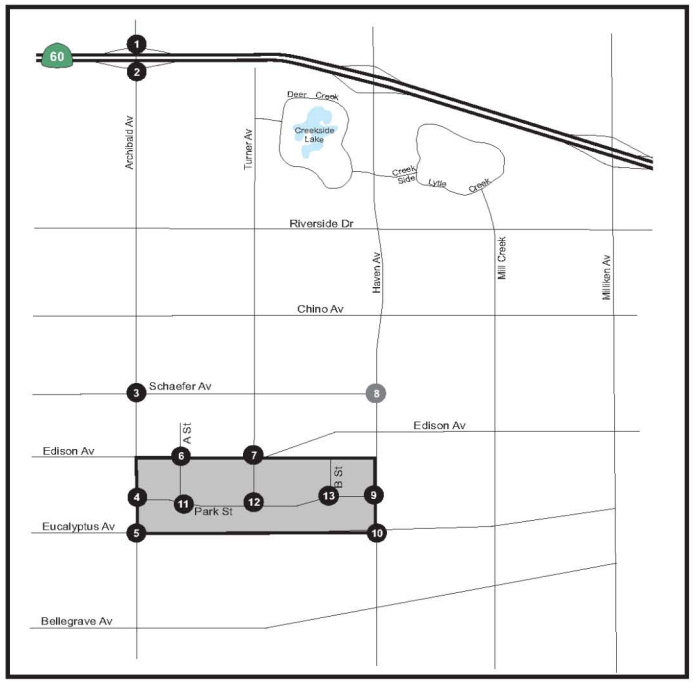
Table IV.L-1: Level of Service Definitions

Level of Service	Description	Signalized Intersection Delay (seconds per vehicle)	Unsignalized Intersection Delay (seconds per vehicle)
A	Excellent operation. All approaches to the intersection appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation.	< 10	< 10
B	Very good operation. Many drivers begin to feel somewhat restricted within platoons of vehicles. This represents stable flow. An approach to an intersection may occasionally be fully utilized and traffic queues start to form.	>10 and < 20	>10 and < 15
C	Good operation. Occasionally drivers may have to wait more than 60 seconds, and back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	>20 and < 35	>15 and < 25
D	Fair operation. Cars are sometimes required to wait more than 60 seconds during short peaks. There are no long-standing traffic queues.	>35 and < 55	>25 and < 35
E	Poor operation. Some long-standing vehicular queues develop on critical approaches to intersections. Delays may be up to several minutes.	>55 and < 80	>35 and < 50
F	Forced flow. Represents jammed conditions. Backups form locations downstream or on the cross street may restrict or prevent movement of vehicles out of the intersection approach lanes; therefore, volumes carried are not predictable. Potential for stop and go type traffic flow.	> 80	> 50
Source: Iteris, Traffic Impact Analysis Report (Table 1), February 20, 2013.			

The following project scenarios were analyzed in the TIA:

- Existing Conditions (2012) - Analyzes current operating conditions at the project site and in the study area.
- Existing Plus Project Conditions (2012) - Analyzes current operating conditions on study area intersections using existing traffic counts.
- Horizon Year Without Project Conditions (2030) - Analyzes the future operating conditions of the study area intersections at the horizon year "without" the proposed project using forecast traffic volumes.





Source: Iteris, February 2013.

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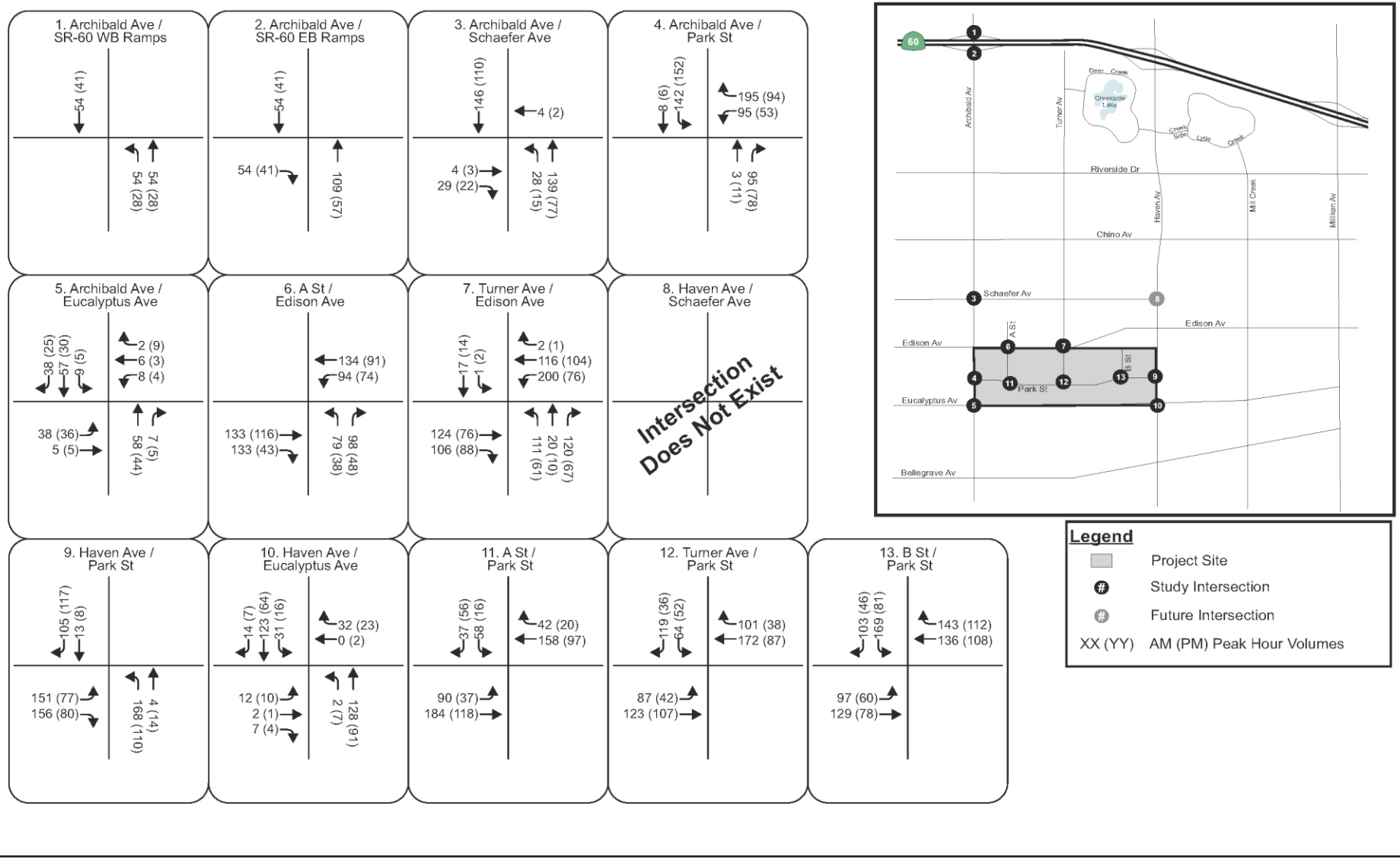
Figure IV.L-3
2012 Project Percentage Trip Generation



Source: Iteris, February 2013.

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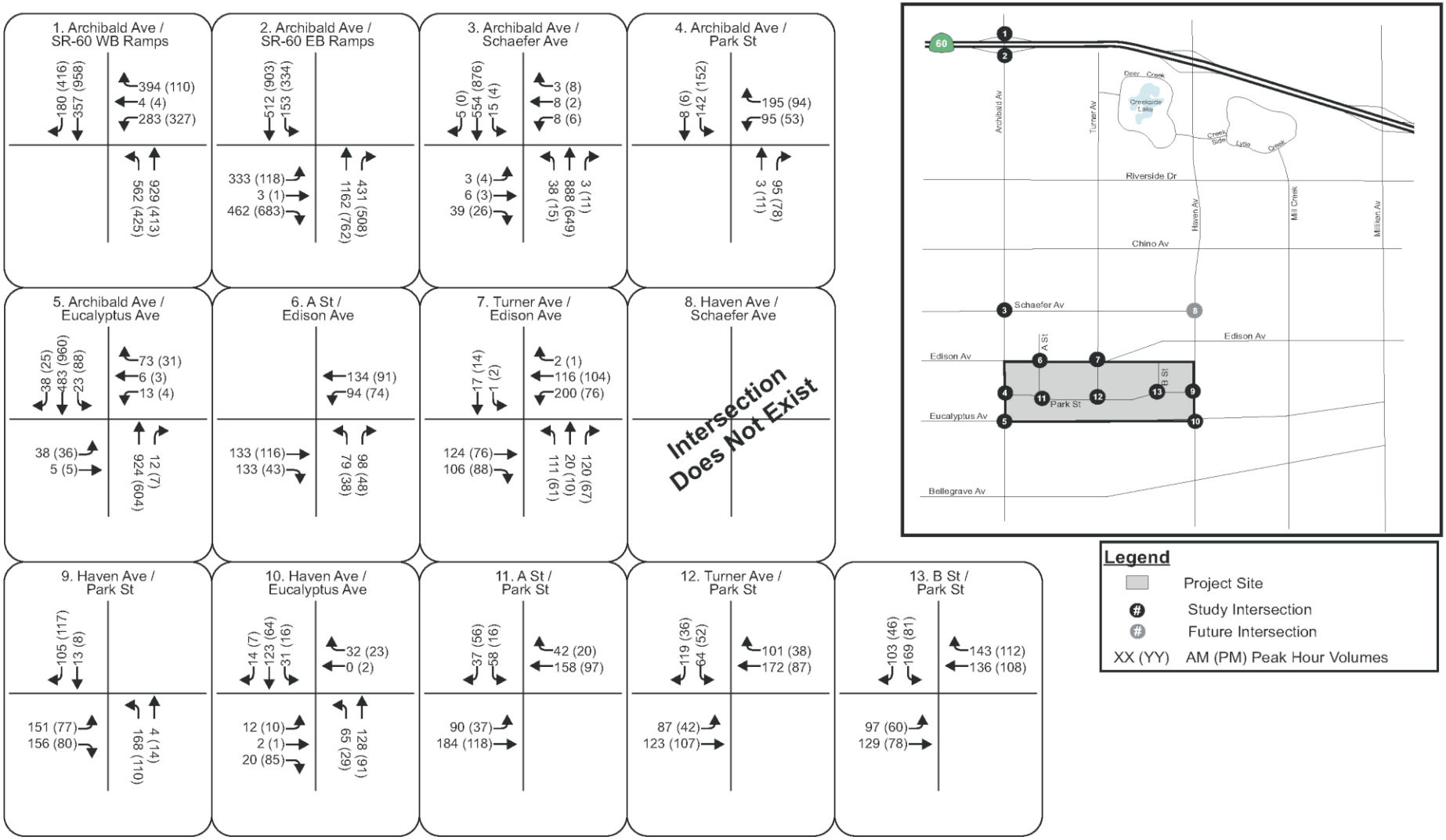
Figure IV.L-4
2012 Project Only AM (PM) Peak Hour Volumes



Source: Iteris, February 2013.

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Figure IV.L-5
Existing + Project AM (PM) Peak Hour Volumes

- Horizon Year With the Project Conditions (2030) - Analyzes the future operating conditions of the study area intersections at the horizon year "with" the proposed project using forecast traffic volumes.

  This scenario also assumes the future intersections would be signalized.

In addition to these four scenarios, an analysis of three proposed roundabouts along Park Street were analyzed. Two of them, "A" Street/Park Street and Turner Avenue/Park Street, will be near the proposed High School in Planning Area 10. The other roundabout is at "B" Street/Park Street, which will be in close proximity to the proposed Elementary School in Planning Area 9. The analysis of traffic operations at the roundabouts was conducted using Federal Highway Administration (FHWA) Roundabout Methodology.

Per the direction provided by the City, a literature review was conducted to determine the feasibility of roundabouts near schools. From our research, we have found that roundabouts have been installed near schools all throughout the U.S., including Montpelier, VT; Howard, WI; University Place, WA; and Kennewick, WA. None has reported any significant problems. We have learned that prior to the opening of the roundabout at Howard, WI; the school required all schoolchildren to arrive by bicycle or car because it was unsafe to cross the street. Since the roundabout opened, children now have a safe crossing location, aided by a crossing guard.

Two roundabouts near schools in California are provided below:

- Encina Ave/Conejo Ave, Modesto, CA - near La Loma Jr. High School.
- Casa Grande Rd and Ely Blvd, Petaluma, Sonoma County, CA - near Casa Grande Sr. High School.

b. Thresholds of Significance

Would the project:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?
- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?
- Result in inadequate emergency access?
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

The Initial Study concluded that no impacts were related to changes in air traffic patterns, hazards from a design feature, and inadequate emergency access. Conflicts with adopted policies, plans, and programs related to public transit, bicycle, and pedestrian facilities were less than significant. Refer to Appendix A-2 for a discussion related to these thresholds.

Although the 2010 revisions to the State CEQA Guidelines eliminated the threshold of significance related to parking, future development projects on-site proposed pursuant to the Grand Park Specific Plan will be required to comply with the parking supply requirements contained in Section 6, Development Standards, of the proposed Specific Plan, or the Ontario Development Code (ODC), as applicable. Compliance with parking requirements on a project-by-project basis will ensure that adequate parking is provided for residents and guests within residential planning areas, and for students and staff within the school campuses.

3) Project Impacts

The following section describes the results of traffic analysis conducted for the three scenarios previously identified.

Existing Plus Project Conditions (2012)

This section analyzes the traffic conditions in the study area during existing conditions with the proposed Specific Plan. The existing plus project traffic volumes were developed as described in the Analysis Methodology section above. The lane configurations at the existing intersections would remain the same and the proposed project would create a few more intersections as part of the development.

A level of service analysis was conducted to evaluate existing plus project intersection operations. Level of service calculation worksheets are included in Appendix C of the TIA. Table IV.L-2 below summarizes the resulting levels of service at study area intersections. Results show that all study area intersections are projected to operate at satisfactory levels of service.

Table IV.L-2: Existing (2012) Plus Project Peak Hour Levels of Service

Intersection Name	Control	AM Peak Hour			PM Peak Hour		
		LOS	Delay (Sec.)	V/C	LOS	Delay (Sec.)	V/C
1. Archibald Ave / SR-60 WB Ramps	Signal	C	26.1	0.795	C	29.3	0.812
2. Archibald Ave / SR-60 EB Ramps	Signal	C	24.9	0.726	D	39.4	0.981
3. Archibald Ave / Schaefer Ave	2WSC	A	1.8	0.000	A	1.1	0.000
4. Archibald Ave / Park St	Signal	C	23.1	0.338	C	24.7	0.250
5. Archibald Ave / Eucalyptus Ave	2WSC	A	5.1	0.000	A	6.2	0.000
6. A St / Edison Ave	Signal	B	16.7	0.189	B	14.6	0.102
7. Turner Ave / Edison Ave	Signal	B	16.0	0.282	B	16.7	0.141
8. Haven Ave / Schaefer Ave	Future Intersection						
9. Haven Ave / Park St	Signal	B	16.2	0.295	B	15.4	0.176
10. Haven Ave / Eucalyptus Ave	2WSC	B	13.4	0.000	A	9.4	0.000
11. A St / Park St	Round-about	A	6.7	0.000	A	5.4	0.000
12. Turner Ave / Park St	Round-about	A	7.0	0.000	A	5.5	0.000
13. B St / Park St	Round-about	A	7.8	0.000	A	6.1	0.000

Notes:
LOS = Level of Service Delay = Average Vehicle Delay (Seconds)
V/C = Volume-to-Capacity Ratio 2WSC - Two-Way Stop Control
Source: Iteris, Traffic Impact Analysis Report (Table 4), February 20, 2013.

Horizon Year Without Project Conditions (2030)

This section analyzes the traffic conditions in the study area during the project's horizon year (2030) under No Project conditions. The 2030 No Project volumes were developed as described in the "Analysis Methodology" section. Intersection lane configuration assumptions in the NMC are based on the information provided in the Ontario New Model Colony Transportation Program Implementation Plan (by Iteris, Inc., February 2001). Information in this report includes conceptual roadway alignments, width of public right-of-way, the number and width of lanes, parkway and median widths, location of bikeways and a conceptual tree planning scheme. The figures in this report were used to designate intersection lane configurations at the study area intersections for Year 2030.

A level of service analysis was conducted to evaluate 2030 No Project intersection operations. Level of service calculation worksheets are included in Appendix C of the TIA. Table IV.L-3 below summarizes the resulting levels of service at study area intersections.

Table IV.L-3: 2030 No Project Peak Hour Levels of Service

Intersection Name	Control	AM Peak Hour			PM Peak Hour		
		LOS	Delay (Sec.)	V/C	LOS	Delay (Sec.)	V/C
1. Archibald Ave / SR-60 WB Ramps	Signal	**F**	**185.4**	**1.556**	**F**	**173.7**	**1.753**
2. Archibald Ave / SR-60 EB Ramps	Signal	**F**	**116.7**	**1.261**	**F**	**214.7**	**1.634**
3. Archibald Ave / Schaefer Ave	Signal	B	18.8	0.394	B	19.3	0.518
4. Archibald Ave / Park St	Signal	B	11.2	0.289	B	10.6	0.431
5. Archibald Ave / Eucalyptus Ave	Signal	C	24.4	0.582	C	30.1	0.798
6. A St / Edison Ave	Signal	A	3.9	0.294	A	3.4	0.329
7. Turner Ave / Edison Ave	Signal	B	14.5	0.463	B	16.6	0.542
8. Haven Ave / Schaefer Ave	Signal	B	17.6	0.389	C	21.2	0.644
9. Haven Ave / Park St	Signal	A	7.7	0.273	B	14.7	0.384
10. Haven Ave / Eucalyptus Ave	Signal	B	14.2	0.366	B	14.4	0.360
11. A St / Park St	Intersection does not exist.						
12. Turner Ave / Park St	Intersection does not exist.						
13. B St / Park St	Intersection does not exist.						

Notes:
LOS = Level of Service Delay = Average Vehicle Delay (Seconds)
V/C = Volume-to-Capacity Ratio **BOLD** indicates unsatisfactory
Source: Iteris, Traffic Impact Analysis Report (Table 5), February 20, 2013.

Results show that all study area intersections are projected to operate at satisfactory levels of service, except for the following two intersections.

- Archibald Ave / SR-60 WB Ramps (LOS F in the AM and PM peak hours)
- Archibald Ave / SR-60 EB Ramps (LOS F in the AM and PM peak hours)

Horizon Year With the Project Conditions (2030)

This section analyzes the traffic conditions in the study area during the project's horizon year (2030) under With Project conditions. The 2030 With Project volumes were developed as described in the "Analysis Methodology" section. Intersection lane configuration assumptions in the NMC are based on the information provided in the Ontario NMC Transportation Program Implementation Plan (by Iteris, Inc., February 2001). Information in this report includes conceptual roadway alignments, width of public right-of-way, the number and width of lanes, parkway and median widths, location of bikeways and a conceptual tree planning scheme. The figures in this report were used to designate intersection lane configurations at the study area intersections for Year 2030.

A level of service analysis was conducted to evaluate 2030 With Project intersection operations. Level of service calculation worksheets are included in Appendix C of the TIA. Table IV.L-4 below summarizes the resulting levels of service at study area intersections.

Table IV.L-4: 2030 with Project Peak Hour Levels of Service

Intersection Name	Control	AM Peak Hour			PM Peak Hour		
		LOS	Delay (Sec.)	V/C	LOS	Delay (Sec.)	V/C
1. Archibald Ave / SR-60 WB Ramps	Signal	**F**	**188.7**	**1.590**	**F**	**177.1**	**1.771**
2. Archibald Ave / SR-60 EB Ramps	Signal	**F**	**120.9**	**1.277**	**F**	**224.8**	**1.658**
3. Archibald Ave / Schaefer Ave	Signal	B	18.9	0.423	B	19.4	0.549
4. Archibald Ave / Park St	Signal	B	19.4	0.499	B	16.1	0.442
5. Archibald Ave / Eucalyptus Ave	Signal	C	25.8	0.631	C	30.7	0.811
6. A St / Edison Ave	Signal	B	11.8	0.384	A	6.1	0.398
7. Turner Ave / Edison Ave	Signal	C	26.7	0.641	C	23.4	0.647
8. Haven Ave / Schaefer Ave	Signal	B	17.8	0.399	C	21.2	0.668
9. Haven Ave / Park St	Signal	B	14.0	0.377	B	14.1	0.427
10. Haven Ave / Eucalyptus Ave	Signal	B	14.0	0.377	B	14.1	0.427
11. A St / Park St	Round-about	A	6.9	0.0000	A	5.4	0.000
12. Turner Ave / Park St	Round-about	A	7.2	0.000	A	5.6	0.000

Table IV.L 4 (cont.): 2030 with Project Peak Hour Levels of Service

Intersection Name	Control	AM Peak Hour			PM Peak Hour		
		LOS	Delay (Sec.)	V/C	LOS	Delay (Sec.)	V/C
13. B St / Park St	Round-about	A	7.9	0.000	A	6.2	0.000

Notes:
LOS = Level of Service Delay = Average Vehicle Delay (Seconds)
V/C = Volume-to-Capacity Ratio **BOLD** indicates unsatisfactory
Source: Iteris, Traffic Impact Analysis Report (Table 6), February 20, 2013.

Results show that all study area intersections are projected to operate at satisfactory levels of service except for two intersections.

- Archibald Ave / SR-60 WB Ramps (LOS F in the AM and PM peak hours)
- Archibald Ave / SR-60 EB Ramps (LOS F in the AM and PM peak hours)

Roundabouts

Regarding the proposed roundabouts, results of the analysis show that all the intersections are projected to operate at LOS A during AM and PM peak hours for all the project scenarios (Existing + Project and 2030 With Project) and do not require mitigation.

4. Mitigation Measures

The following recommended mitigation measures, if implemented, would bring the deficient intersections to acceptable operating conditions (LOS D or better and V/C of less than 1.0) per the City standards. These proposed measures are consistent with the recommended lane configurations identified in TOP (January 26, 2010). Levels of service calculation worksheets are included in Appendix C of the TIA. Refer to the discussion above under Section 2, Environmental Setting for a discussion of the proposed Archibald Avenue/SR-60 interchange project and the application of Development Impact Fees. In addition, the City will determine the "fair share" contribution from the proposed project contingent upon the need at the time of the Grand Park Specific Plan approval.

Mitigation Measure L-1: Archibald Avenue / SR-60 WB Ramps

The project shall contribute fair share development impact fees towards the following improvements to be completed as part of the freeway interchange improvement project included in the SANBAG 2010-2040 Measure I Nexus Study. The City will determine the fair share contribution from the proposed project contingent upon need at the time of Grand Park Specific Plan approval.

- Provide an additional exclusive NB left-turn lane

- Re-stripe the SB shared through/right-turn lane as an exclusive right-turn lane and provide an additional exclusive SB right-turn lane
- Re-stripe the WB shared left-turn/through lanes as a shared left-turn/right-turn lane and provide an additional exclusive WB left-turn lane

Mitigation Measure L-2: Archibald Avenue / SR-60 EB Ramps

The project shall contribute fair share development impact fees towards the following improvements to be completed as part of the freeway interchange improvement project included in the SANBAG 2010-2040 Measure I Nexus Study. The City will determine the fair share contribution from the proposed project contingent upon need at the time of Grand Park Specific Plan approval.

- Re-stripe the NB shared through/right-turn lane as an exclusive right-turn lane
- Provide an additional exclusive SB left-turn lane
- Re-stripe the EB shared left-turn/through lanes as a shared left-turn/right-turn lane and provide an additional exclusive EB left-turn lane

Mitigation Measure L-3: Traffic Signals

Contingent upon need at the time of Specific Plan approval, the project shall construct or pay prior to issuance of building permits its fair share towards the installation of traffic signals at the following locations:

- Edison Avenue / A Street
- Edison Avenue / Turner Avenue
- Haven Avenue / Park Street
- Archibald Avenue / Park Street

The project shall pay its fair share towards the need to modify the existing traffic signal at the following location:

- Archibald / Edison

5. Cumulative Impacts

As previously discussed, the traffic model utilized for the analysis of project-specific impacts is based on the buildout of the eastern NMC, which therefore accounts for cumulative growth in the area. Therefore, the cumulative growth associated with implementation of the various specific plans in the area has been incorporated into the traffic model and is represented by

the 2015 Without Project Conditions traffic volumes. As shown in the previous analysis, project impacts, and therefore cumulative impacts, would be reduced to less than significant with implementation of applicable intersection improvements included as mitigation measures. Likewise, cumulative impacts to roadway segments would be less than significant, as the traffic model indicates that no significant roadway segment impacts would occur even with implementation of the proposed project and cumulative projects. Impacts related to emergency access, parking, and alternative transportation are site- and project-specific, and would vary from project to project. However, it is assumed that like the proposed project, future development projects pursuant to other specific plans in the NMC would be reviewed for consistency with applicable plans, policies, and regulations to ensure that adequate emergency access, parking, and alternative transportation facilities are provided to meet demands. Given compliance with applicable requirements, cumulative impacts related to emergency access, parking, and alternative transportation would be less than significant and no mitigation is required.

6. Level of Significance After Mitigation

Impacts to impacted intersections would be reduced to less than significant with implementation of the recommended mitigation measures. Table IV.L-5 below provides the mitigated level of service incorporating the recommended mitigation measures.

Table IV.L-5: 2030 with Project with Proposed Improvements Peak Hour Levels of Service

Intersection Name	Control	AM Peak Hour			PM Peak Hour		
		LOS	Delay (Sec.)	V/C	LOS	Delay (Sec.)	V/C
1. Archibald Ave / SR-60 WB Ramps	Signal	D	50.6	1.064	D	37.4	0.993
2. Archibald Ave / SR-60 EB Ramps	Signal	C	29.0	0.960	D	52.3	1.150

Notes:
LOS = Level of Service Delay = Average Vehicle Delay (Seconds)
V/C = Volume-to-Capacity Ratio
Source: Iteris, Traffic Impact Analysis Report (Table 7), February 20, 2013.