4.8 TRANSPORTATION

4.8.1 Introduction

This section of the Recirculated Draft SEIR (SEIR) describes the existing transportation infrastructure that serves the project site and its vicinity and potential impacts to the transportation infrastructure from campus development under the proposed 2020 LRDP. Regulations and policies affecting the transportation in the project area are also summarized. Information presented in this section is based on the Transportation Impact Analysis (TIA) prepared for this project. The TIA is included in **Appendix 4.8**.

The 2009 UC Merced/University Community Plan EIS/EIR (2009 LRDP EIS/EIR) included a transportation impact analysis for a 25,000-student campus and full development of the University Community to the south of the campus. That traffic analysis is no longer relevant because the University is not anticipated to grow to an enrollment level of 25,000 students by 2030. The University has updated its traffic analysis for this SEIR, which assesses a much smaller amount of development: a 15,000-student campus (17,500 students under cumulative conditions, although there are currently no plans nor funding to expand the campus beyond 15,000 students) and no University Community development to the south of the campus (as none was proposed at the time of publication and scoping under the NOP for this SEIR). As such, the traffic impacts, including cumulative impacts with other development throughout the City of Merced and Merced County within and near the campus, are substantially less than those identified in the 2009 LRDP EIS/EIR. With the certification of the 2020 LRDP SEIR and adoption of the 2020 LRDP, the University intends to supersede the mitigation measures previously identified in the 2009 LRDP EIS/EIR with the updated mitigations and improvements identified in the analysis below.

With regard to University Community North, as discussed in **Section 1.0**, the UCLC property to the south of the campus was subdivided in 2017. Some of the land area that made up the University Community North was added to the campus and about 634 acres of the former University Community North lands were transferred to the Virginia Smith Trust (VST). When VST moves forth with land development plans for the 634-acre property, it will obtain land use permits and approvals from the County or the City and will implement mitigation measures that are imposed on the development by the authorizing land use jurisdiction.

4.8.2 Environmental Setting

Roadway Network

The roadway network in the study area is shown in **Figure 4.8-1, Project Study Area**. This figure also shows the study intersections. The study area encompasses the roadway network extending from

Bellevue Road on the north to State Route 99 on the south, and from Highway 59 on the west and Lake Road on the east. Roadway facilities in downtown Merced between V Street and G Street along W 16th Street were also evaluated. The area surrounding the UC Merced campus (hereinafter project site) is largely undeveloped with the exception of development on the campus and rural residences in the surrounding areas. Limited roadway infrastructure is in place. The project site can be accessed by two two-lane rural roads, namely Bellevue Road and Lake Road. Descriptions of the local and regional roadways in the vicinity of the campus that are relevant to the proposed project are provided below.

State Route 99 (hereinafter SR 99 or Highway 99 as it is locally known) is the primary regional facility in the Merced area. Highway 99 provides access to San Francisco and Sacramento to the north, and Fresno and Bakersfield to the south. Through the City of Merced, Highway 99 is a four-lane freeway with two lanes in each direction. Future plans call for improvements to Highway 99 throughout the Central Valley.

State Route 140 (hereinafter Highway 140 or Yosemite Parkway as it is locally known) is a major east-west highway serving recreational and local traffic. Highway 140 is a two-lane rural highway that provides regional access to Yosemite National Park to the east.

State Route 59 (hereinafter Highway 59 as it is locally known) is a north-south facility extending from State Route 152 (near Los Banos) to Snelling, a community located north of the City of Merced. Highway 59 is a two-lane rural highway through Merced.

G Street is a north-south roadway extending from Highway 99 to La Paloma Road, where it turns into Snelling Road (Highway 59). G Street is a four-lane roadway south of Yosemite Avenue with left-turn pockets at major intersections. North of Yosemite Avenue, G Street expands to five lanes, three southbound and two northbound, with left-turn pockets until Mercy Avenue, where G Street narrows to become two lanes. North of Cardella Road, G Street expands back to four lanes until Farmland Avenue, where G Street narrows back to two lanes.

Olive Avenue is an east-west street providing cross-town access. West Olive Avenue connects Highway 59 and R, M, and G Streets. It is a six-lane facility west of G Street, primarily serving a commercial corridor. West of Highway 59, Olive Avenue becomes Santa Fe Drive, connecting the northern portions of Merced to the City of Atwater and Castle Air Force Base. East of G Street, East Olive Avenue transitions from four lanes to two lanes and provides access to one of Merced's largest residential areas.

Yosemite Avenue is an east-west road extending from Highway 59 to its eastern terminus at Arboleda Drive. Yosemite Avenue is a two-lane facility west of Arboleda Drive until Lake Road, where the roadway becomes a four-lane roadway. West of McKee Road, Yosemite Avenue narrows to three travel

lanes (two eastbound and one westbound) and expands back to four lanes west of North Gardner Avenue.

Bellevue Road is a two-lane east-west road extending from Fox Road on the west to its eastern terminus at Lake Road and is one of the two access roads to the campus. This roadway currently carries approximately 8,500 vehicles per day, west of Lake Road.

Lake Road is a two-lane north-south road extending from Yosemite Avenue to its northern terminus at Lake Yosemite and is the other access road to the campus. This roadway currently carries approximately 5,600 vehicles per day, south of Bellevue Road.

Scope of Transportation Analysis

The scope of the transportation analysis in this SEIR was determined based on consultation with both the City of Merced and Merced County. It included intersections near the campus which would serve the highest number of project trips; intersections identified as significant impact locations in the 2009 LRDP EIS/EIR; and additional intersections requested by the City of Merced during project scoping, for a total of 19 intersections and six freeway segments. The County did not request an analysis of any other intersections or roadway segments at that time.

Study Intersections

Nineteen intersections within the study area were analyzed for both existing (November 2017) and future conditions, as shown in **Figure 4.8-1** and listed below:

1. West Bellevue Road/ Highway 59
2. Bellevue Road/G Street
3. East Bellevue Road/Lake Road
4. Cardella Road/G Street
5. East Cardella Road/Lake Road
6. West Yosemite Avenue/ Highway 59
7. Yosemite Avenue/G Street
8. East Yosemite Avenue/Parsons Avenue/North Gardner Avenue
9. West Olive Avenue/Highway 59
10. East Yosemite Avenue/McKee Road
11. East Yosemite Avenue/Lake Road
12. West Olive Avenue/R Street
13. West Olive Avenue/M Street
14. Olive Avenue/G Street
15. West 16th Street/Highway 59
16. SR 99 Northbound Ramps/MLK Jr. Way
17. SR 99 Northbound Off-Ramp/West 14th Street/G Street
18. Lake Road/New UC Merced Driveway 1 (2020 Project Driveway)
19. Lake Load/New UC Merced Driveway 2 (2020 LRDP New Driveway)

Freeway Segments

The following freeway segments were analyzed for both existing and future conditions:

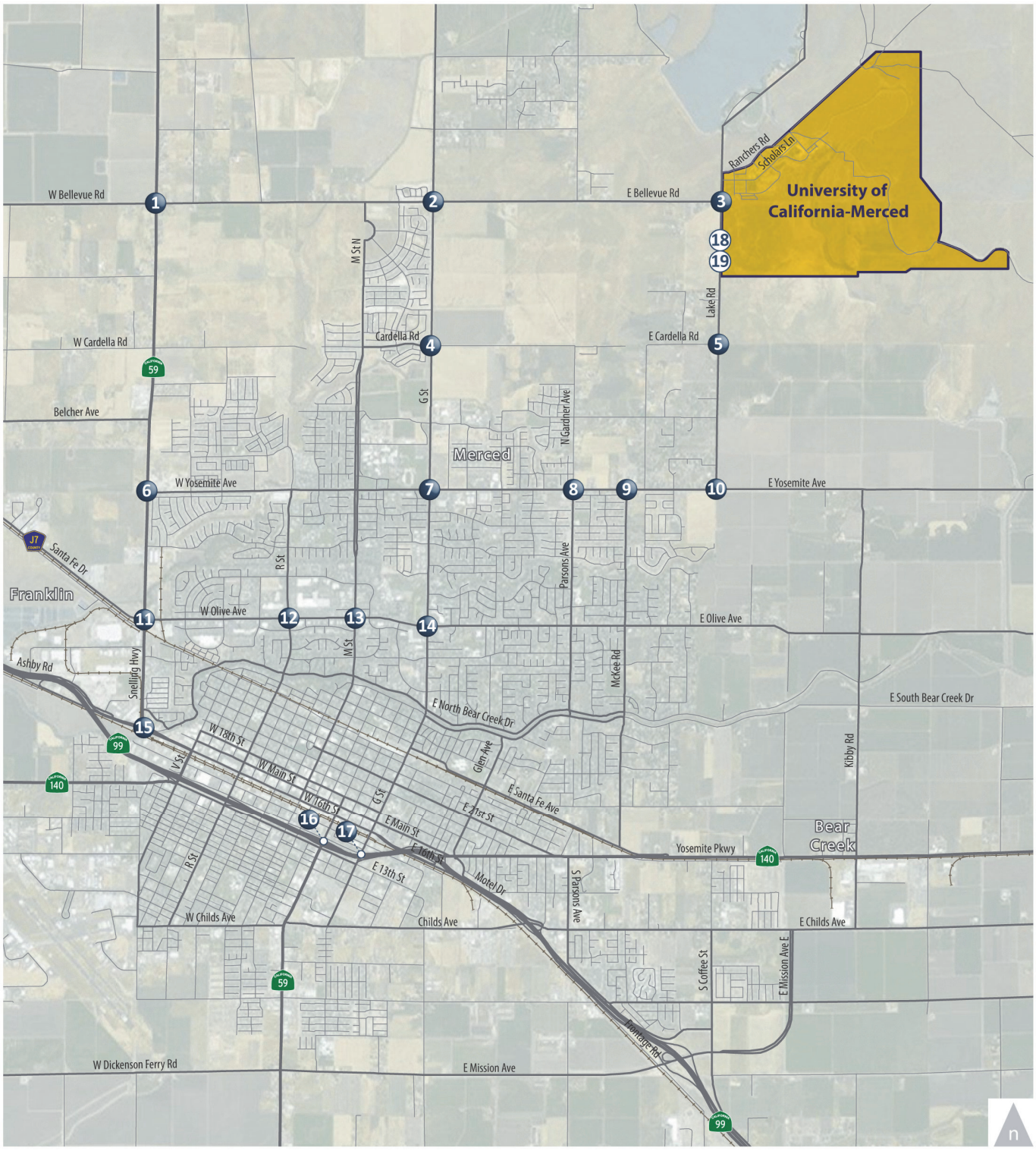
1. SR 99 North of 16th Street
2. SR 99 North of SR 140
3. SR 99 North of MLK
4. SR 99 South of MLK
5. SR 99 South of G Street
6. SR 99 South of Mission Street

Roadway Segments, including Campus Parkway

A roadway segment analysis was determined not to be needed based on the substantially lower traffic forecasts generated by campus development under the 2020 LRDP and other development in the City and County of Merced.

With regard to the section of Campus Parkway between Yosemite Avenue and Bellevue Road, the transportation impact analysis does not analyze the roadway (and instead assigns the traffic to Lake Road between Yosemite Avenue and Bellevue Road) because no funding has been identified by the Merced County Association of Governments nor Merced County for this section and it is not foreseeable that this section would be constructed between 2020 and 2030.

With respect to the Campus Parkway alignment on the campus, the 2020 LRDP reserves space for the potential future construction of Campus Parkway within the UC Merced campus. However, because construction of Campus Parkway north of East Yosemite Avenue currently has no funding identified by the Merced County Association of Governments nor Merced County, and would depend on funding and alignment studies conducted by developers of the properties to the south of UC Merced, the University cannot plan on completion of this roadway within the planning horizon of the 2020 LRDP. Therefore, the University has reserved space for a potential future Campus Parkway facility and the traffic impact analysis assumed that the campus roadway network would function with the public roadway network currently in place.



LEGEND

Project Site

Study Intersection

With Project Study Intersection

SOURCE: Fehr & Peers, 2019

FIGURE **4.8-1**

Project Study Area

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With regard to impacts on the intersections along Campus Parkway, the TIA assigns between 9 and 116 directional project trips (depending on the analysis period and scenario, 2030 or 2035) to or from East Yosemite Avenue east of Lake Road, reflecting traffic designed to the east and southeast of the city. Some of this traffic would choose Campus Parkway, once it is constructed to East Yosemite Avenue. If all of these trips used Campus Parkway, those trips would constitute about 4 percent to 6 percent of the approximate capacity of the roadway, using an approximate capacity of 1,800 vehicles per hour per direction (900 vehicles per hour per lane). Based on this small proportional use of the roadway's capacity, and the fact that the roadway is already funded and under construction, analysis of the project's impacts on Campus Parkway was determined not to be needed. It is also noted that the Campus Parkway EIR documentation does not provide intersection-level traffic forecasts for new intersections along Campus Parkway, and therefore insufficient data was available to perform an analysis of intersections along the future roadway.

Parking

Analysis of a project's impact on parking, in and of itself, is exempt from CEQA review and is therefore not included in the SEIR. While a lack of parking can result in secondary effects such as localized congestion due to vehicles circling to find parking, that is not a concern for the roadways near the campus.

Traffic Analysis Methodology

The operations of roadway facilities are described with the term "level of service" (LOS). LOS is a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (i.e., best operating conditions) to LOS F (worst operating conditions). LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result, and operations are designated as LOS F.

Different criteria and methods were used to assess operating conditions for the various types of facilities analyzed in this study, including signalized and unsignalized intersections, and freeway segments. The LOS criteria and methods for each of these facilities are described in the following sections.

Signalized Intersections

Traffic conditions at signalized intersections were evaluated using the method from Chapter 16 of the Transportation Research Board's 2010 *Highway Capacity Manual*. This operations analysis method uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the average control delay experienced by motorists traveling through an intersection. Control

delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 4.8-1, Signalized Intersection Level of Service Criteria**, summarizes the relationship between average control delay per vehicle and LOS for signalized intersections. In the City of Merced, acceptable operations at signalized intersections are defined as LOS D or better. LOS C is the limit of acceptable operation for intersections in the County. Synchro, version 9.0, was used to calculate signalized intersection LOS.

Table 4.8-1
Signalized Intersection Level of Service Criteria

Level of Service	Description of Traffic Conditions	Average Control Delay (seconds/vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0
E	Operations with long delays indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80.0

Source: Highway Capacity Manual (Transportation Research Board 2010).

Unsignalized Intersections

Traffic conditions at unsignalized intersections were evaluated using the method from Chapter 17 of the 2010 *Highway Capacity Manual*. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each movement that must yield the right-of-way. This incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. For all-way stop-controlled intersections, the average control delay is calculated for the intersection as a whole. At two-way or side street-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, the left-turn movement from the major street, and the entire intersection. For controlled approaches composed of a single lane, the control delay is computed as the average delay of all movements in that lane. The delays for the entire intersection and for the movement or approach with the highest delay are reported. **Table 4.8-2, Unsignalized Intersection Level of Service Criteria**, summarizes the relationship between delay and LOS for unsignalized intersections.

Table 4.8-2
Unsignalized Intersection Level of Service Criteria

Level of Service	Description of Traffic Conditions	Average Control Delay (seconds/vehicle)
A	Little or no delays	< 10
B	Short traffic delays	10 – 15
C	Average traffic delays	15 – 25
D	Long traffic delays	25 – 35
E	Very long traffic delays	35 – 50
F	Extreme traffic delays with intersection capacity exceeded	> 50

Source: Highway Capacity Manual (Transportation Research Board 2010).

Freeway Segments

Freeway segments were analyzed using volume-to-capacity (V/C) ratios. The analysis results are presented as a ratio, which is a measure of traffic operating conditions and compares the volume to the road's capacity based on the number of lanes. A maximum lane capacity of 1,800 vehicles per hour per lane was used to assess the capacity of each freeway segment. A V/C ratio of 1.0 means that the roadway would operate at capacity and some delays and queuing would be expected, while a V/C ratio of 0.85 or less indicates that vehicles would typically not experience noticeable delays. Freeways are considered to operate at an acceptable level when the V/C ratio is 0.90 or less.

Existing Levels of Service

Intersection Levels of Service

Existing (November 2017) operations were evaluated for the weekday AM and PM peak hours at the existing study intersections. **Figure 4.8-2, Existing Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls**, show the intersection control type, lane geometry, and peak hour volumes for the study intersections. The existing traffic volumes were used with the existing lane configurations and signal phasing/timing as inputs into the LOS calculations. **Table 4.8-3, Existing Intersection Levels of Service**, summarizes the results. Detailed intersection LOS calculation worksheets are presented in **Appendix 4.8**.

Table 4.8-3
Existing Intersection Levels of Service

Intersection	Traffic Control	Peak Hour[1,2]	Delay (Seconds)	LOS
1. West Bellevue Road/Highway 59	AWS	AM PM	**41.3** 13.2	**E** B
2. Bellevue Road/G Street	Signal	AM PM	36.6 21.0	D C
3. East Bellevue Road/Lake Road	AWS[3]	AM PM	53.6 70.8	F F
4. Cardella Road/G Street	Signal	AM PM	11.4 6.8	B A
5. East Cardella Road/Lake Road	SSS	AM PM	0.4 (13.4) 0.2 (12.4)	A (B) A (B)
6. West Yosemite Avenue/ Highway 59	Signal	AM PM	13.1 11.4	B B
7. Yosemite Avenue/G Street	Signal	AM PM	40.1 43.1	D D
8. East Yosemite Avenue/Parsons Avenue/North Gardner Avenue	AWS	AM PM	28.7 21.2	D C
9. East Yosemite Avenue/McKee Road	Signal	AM PM	8.6 8.2	A A
10. East Yosemite Avenue/Lake Road	SSS	AM PM	6.4 (17.3) 10.2 (16.8)	B (C) B (C)
11. West Olive Avenue/ Highway 59	Signal	AM PM	48.4 49.8	D D
12. West Olive Avenue/R Street	Signal	AM PM	46.6 **56.4**	D **E**
13. West Olive Avenue/M Street	Signal	AM PM	48.1 55.0	D D
14. Olive Avenue/G Street	Signal	AM PM	45.5 47.0	D D
15. West 16th Street/ Highway 59	AWS	AM PM	78.7 95.0	F F
16. SR 99 Northbound Ramps/MLK Jr. Way	SSS	AM PM	3.5 (16.5) 2.8 (18.3	A (C) A (C)
17. SR 99 Northbound Off-Ramp/West 14th Street/G Street	SSS	AM PM	2.4 (20.1) 2.0 (22.5)	A (C) A (C)

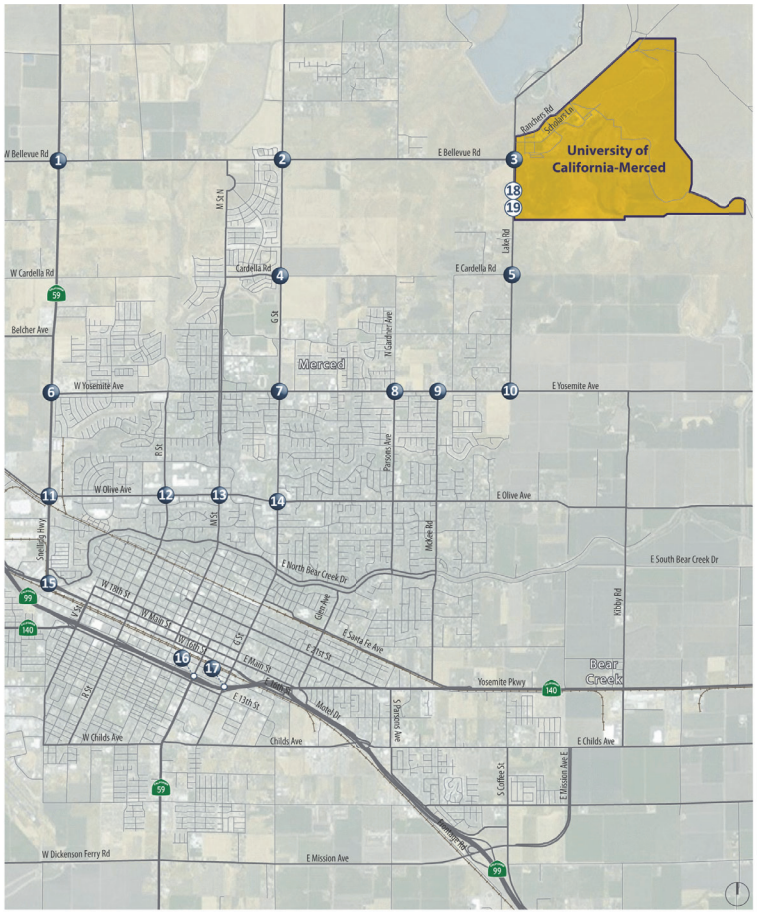
Source: Fehr & Peers August 2019.

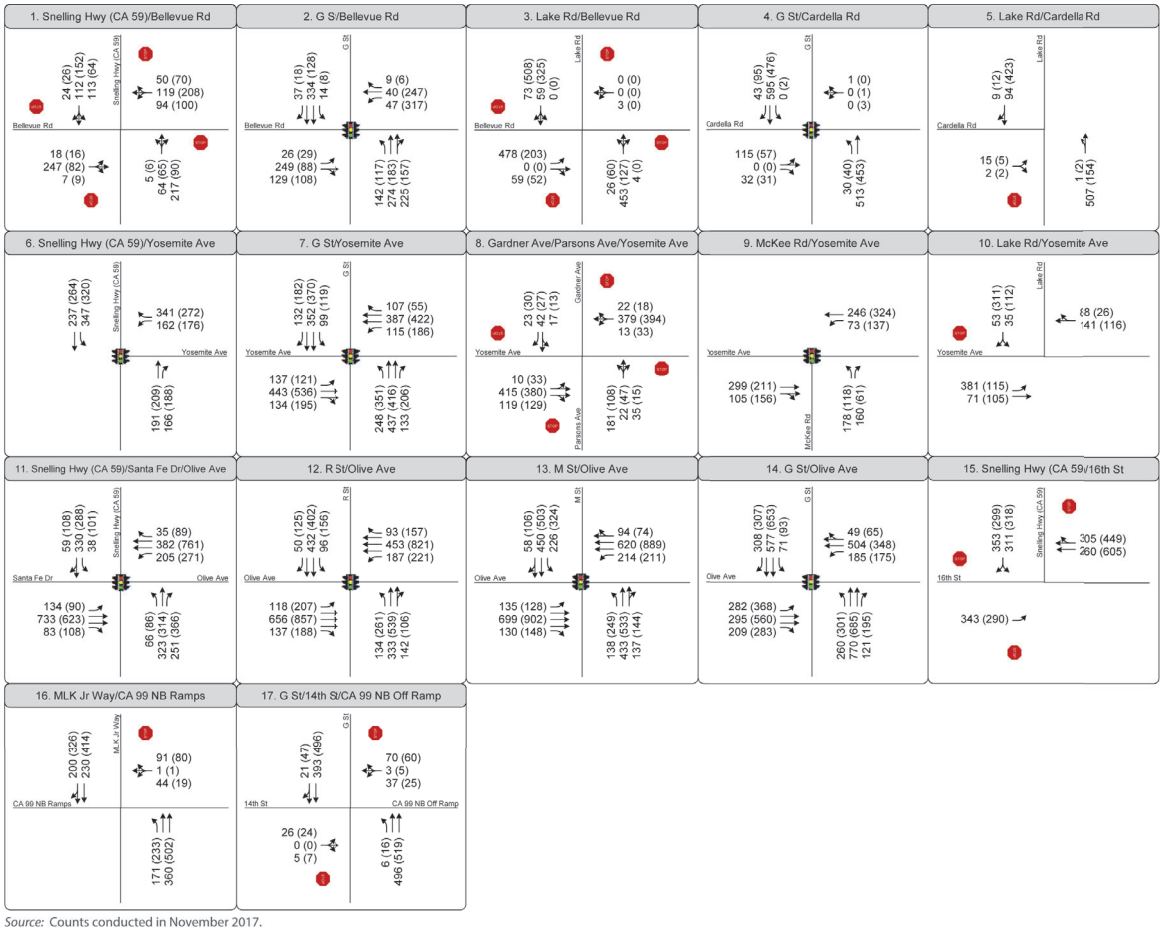
[1] *Signal = signalized intersection; AWS=all-way stop; SSS=side street stop.*

[2] *For side-street stop-controlled intersections, two service levels are listed: Average intersection LOS (LOS for worst side-street movement).*

[3] *East Bellevue Road/Lake Road was an all-way stop when traffic counts were taken in November 2017. It was subsequently signalized. It is therefore analyzed as an all-way stop for existing conditions, and as a signal for all other scenarios.*

LOS D is the limit of acceptable intersection operations in the City of Merced and in Merced County. Field observations and the level of service results indicate that, as of November 2017, most intersections operated acceptably during the weekday AM and PM peak hours, with a few exceptions.





Source: Counts conducted in November 2017.

XX (YY) AM (PM) Peak Hour Traffic Volumes | Signalized Intersection | Stop Sign

Project Site | # Study Intersection

SOURCE: Fehr & Peers, 2019

FIGURE **4.8-2**

Existing Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

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During the AM peak hour, the following intersections operated at an overall LOS E or F:

- West Bellevue Road/Highway 59 (LOS E)
- East Bellevue Road/Lake Road (All-way stop) (LOS F)
- West 16th Street/Highway 59 (LOS F)

During the PM peak hour, the following intersections operated at an overall LOS E or F:

- East Bellevue Road/Lake Road (All-way stop) (LOS F)
- West Olive Avenue/R Street (LOS E)
- West 16th Street/Highway 59 (LOS F)

The intersection of East Bellevue and Lake Roads has since been signalized and operates at an acceptable level of service as of 2018.

Traffic Signal Warrants

To assess the need for signalization of stop-controlled intersections, the *California Manual of Uniform Traffic Control Devices* presents nine signal warrants. The Peak Hour Volume Warrant (Warrant 3) is used in this study as a supplemental analysis tool to assess operations at unsignalized intersections.[1] Detailed signal warrant calculations are provided in **Appendix 4.8**. The results of the traffic signal warrant analysis indicate that the peak hour volume traffic signal warrant is currently satisfied (as of November 2017) at the following unsignalized intersections:

- East Bellevue Road/Lake Road
- West 16th Street/Highway 59
- East Yosemite Avenue/Parsons Avenue/Gardner Avenue

[1] Unsignalized intersection warrant analysis is intended to examine the general correlation between existing conditions and the need to install new traffic signals. Existing peak-hour volumes are compared against a subset of the standard traffic signal warrants recommended in the California Manual of Uniform Traffic Control Devices (MUTCD). This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated based on field-measured traffic data and a thorough study of traffic and roadway conditions by an experienced engineer. Furthermore, the decision to install a signal should not be based solely on the warrants because the installation of signals can lead to certain types of collisions. The responsible state or local agency should undertake regular monitoring of actual traffic conditions and accident data and conduct a timely re-evaluation of the full set of warrants in order to prioritize and program intersections for signalization.

In addition, it is noted that although the signal warrant is met at the intersection of East Yosemite Avenue/Parsons Avenue/Gardner Avenue, the levels of service are acceptable (LOS C in the AM peak hour and D in the PM peak hour).

Freeway Operations

Existing operations were evaluated for the weekday AM and PM peak hours for the Highway 99 freeway segments through Merced. The results are summarized in **Table 4.8-4, Existing Freeway Levels of Service**. All freeway segments operate with a V/C ratio of 0.51 or lower in the AM peak hour, and 0.61 or lower in the PM peak hour. Based on this assessment, there is excess freeway capacity, and drivers do not experience substantial delays under normal conditions.

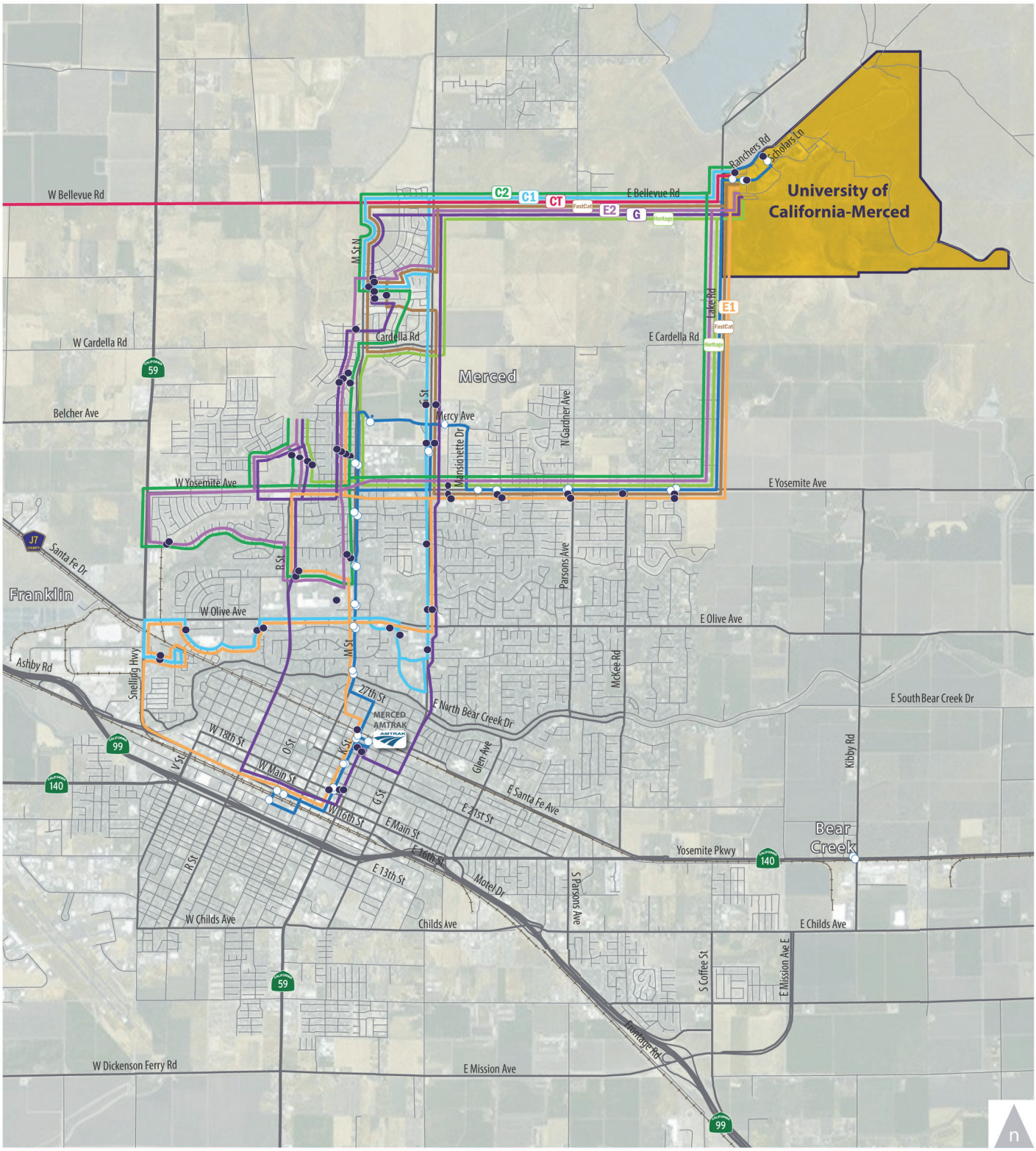
Table 4.8-4
Existing Freeway Levels of Service

Location	Direction	Peak Hour	V/C Ratio
1. SR 99 North of 16th Street	NB	AM PM	0.50 0.61
	SB	AM PM	0.50 0.61
2. SR 99 North of SR 140	NB	AM PM	0.47 0.59
	SB	AM PM	0.50 0.61
3. SR 99 North of MLK	NB	AM PM	0.48 0.59
	SB	AM PM	0.51 0.61
4. SR 99 South of MLK	NB	AM PM	0.51 0.61
	SB	AM PM	0.51 0.60
5. SR 99 South of G Street	NB	AM PM	0.51 0.61
	SB	AM PM	0.51 0.61
6. SR 99 South of Mission Street	NB	AM PM	0.51 0.61
	SB	AM PM	0.38 0.53

Source Fehr & Peers August 2019.

Transit Service

The UC Merced campus is accessible by transit both locally and regionally. **Figure 4.8-3, Transit Routes**, shows the weekday bus routes that currently serve the UC Merced campus.



LEGEND

- Project Site
- Merced Transit Authority (The Bus)
- The Bus Stop
- CatTracks Stop

UC Merced CatTracks

- CT — CampusTrax
- C1 — Route C1
- C2 — Route C2
- FastCat — FastCat
- E1 — Route E1
- E2 — Route E2
- G — Route G
- Heritage — Heritage

SOURCE: Fehr & Peers, 2019

FIGURE **4.8-3**

Transit Routes

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Amtrak provides regional train service to Merced on the *San Joaquins* line with six trains per day operating in each direction. This service connects Merced with the San Francisco Bay Area, Fresno, Bakersfield, and other cities in the Central Valley. Connections are also available to southern California, including San Diego, Oceanside, Santa Ana, and Los Angeles.

The Bus provides transit service for Merced County. The Bus operates 17 routes (13 of which serve Merced), including a UC Merced Route which serves the UC Merced campus. Service to the campus is provided Monday through Friday between 6:10 AM and 8:02 PM.

CatTracks is funded by UC Merced and provides local bus service to the campus. CatTracks connects the campus and surrounding areas, including downtown Merced and research facilities located on the former Castle Air Force base. The following routes are provided when classes are in regular session:

- CampusTrax connects the campus and Castle Research Facilities. Service is provided between 7:30 AM and 6:10 PM Monday – Friday with 50-minute headways. A one-way trip takes 30 minutes.
- Route C-1 connects the campus with retail locations along West Olive Avenue and G Street, and to the Granville Apartments. Service is provided between 5:45 AM and 12:47 AM Monday – Friday with 40-minute headways. A round-trip takes 80 minutes.
- Route C-2 connects the campus with Merced College, retail locations along Yosemite Avenue and Loughborough Drive, and multiple housing locations. Service is provided between 5:25 AM and 11:05 PM Monday – Friday with 60-minute and 80-minute headways. A round-trip takes about 60 minutes.
- Route E-1 connects the campus with Merced College, Amtrak station, retail and entertainment locations in downtown and along Yosemite and Olive Avenues in the city of Merced, and various housing complexes. Service is provided on weekends only, from 11:05 AM to 11:09 PM.
- Route E-2 connects the campus to Merced Mall, retail locations on Yosemite Avenue, and to various housing locations north of Olive Avenue. Service is provided on weekends only, from 11:05 AM to 9:43 PM.
- Route G connects the campus to downtown Merced and Amtrak along O and K Streets and runs on a one-directional loop Monday – Friday between 5:40 AM and 9:09 PM. Six trips are provided in the AM with 70-minute headways, and seven trips in the PM.
- FastCat connects the campus to the Moraga and Bellevue subdivisions, Mercy Hospital, Yosemite Church, and various medical offices. Service is provided Monday – Friday between 5:55 AM and 11:41 PM with 65-minute headways. A round-trip takes 65 minutes.
- Heritage Line is available to Heritage Residents only and connects the campus to the "R" Street Village Apartments. Service is provided Monday – Friday between 5:40 AM and 11:57 PM, and Saturday – Sunday between 10:00 AM and 10:11 PM, with 18-minute and 36-minute headways respectively.

YARTS (Yosemite Area Regional Transportation System) connects the city of Merced to Yosemite National Park. In the eastbound direction, six trips (two AM, four PM) are provided between Yosemite National Park and Merced. In the westbound direction, six trips (four AM, two PM) are provided.

Pedestrian and Bicycle Facilities

Pedestrian facilities include sidewalks, off-street paths, crosswalks, and pedestrian signals. Sidewalks are generally provided in developed areas in Merced and are being added in undeveloped areas as the adjacent parcels are developed. No sidewalks exist along Bellevue Avenue nor Lake Road within two miles of the project site. Crosswalks and pedestrian signals are provided at all signalized study intersections in the area. The trail along Lake Road provides direct access to the UC Merced campus and joins with existing sidewalks along Yosemite Avenue and the Black Rascal Creek trail connector.

Bicycle facilities include the following:

- Bike paths (Class I) – Paved trails that are separated from roadways.
- Bike lanes (Class II) – Lanes on roadways designated for use by bicycles through striping, pavement legends, and signs.
- Bike routes (Class III) – Designated roadways for bicycle use by signs only; may or may not include additional pavement width for cyclists.
- Class IV bikeways (cycle tracks or "separated" bike lanes) - Provide a right-of-way designated exclusively for bicycle travel within a roadway and are protected from other vehicle traffic with devices, including, but not limited to, grade separation, flexible posts, inflexible physical barriers, or parked cars.

Class I bicycle facilities are provided along Fahrens Creek, Cottonwood Creek, Bear Creek, Black Rascal Creek, and Lake Road. Lake Road provides direct access to the UC Merced campus and can be accessed via Class II bicycle lanes along Yosemite Avenue and the recently completed Black Rascal Creek trail connector.

Class II bicycle facilities include many of the arterial streets within the City of Merced, including major sections of G Street, M Street, Yosemite Avenue, and McKee Road. Designated bicycle lanes are provided along R Street, V Street, West Avenue, Main Street, 18th Street, 21st Street, Grogan Avenue, and Parsons Avenue.

Class III bicycle facilities are located on some sections arterials streets and various collector streets, including V Street, 26th Street, Glen Avenue, 13th Street, 14th Street, and Childs Avenue. The nearest Class III bicycle route to the project site is over 2 miles away.

4.8.3 Regulatory Considerations

State Laws and Regulations

Senate Bill 743

Senate Bill 743, passed in 2013, (Steinberg, 2013), required the Office of Planning and Research (OPR) to update *State CEQA Guidelines* to include new transportation impact-related evaluation metrics that are in line with the state's goal of reducing greenhouse gas emissions by developing sustainable communities that are based on denser infill development, reduced reliance on individual vehicles, and improved mass transit. OPR undertook a 5-year long process of revising the *State CEQA Guidelines* and regulatory changes to the *State CEQA Guidelines* that implement SB 743 were approved on December 28, 2018. These changes to the guidelines identify vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project's transportation impacts. With the California Natural Resources Agency's certification and adoption of the changes to the *State CEQA Guidelines*, automobile delay, as measured by "level of service" and other similar metrics, generally no longer constitutes a significant environmental effect under CEQA. (Pub. Resources Code, § 21099, subd. (b)(3).) Although agencies may begin the use of new metrics whenever they so choose, July 1, 2020 is the statewide implementation date. OPR has published a technical advisory that includes suggested thresholds that a lead agency may use to evaluate a project's traffic impact based on VMT (OPR 2018). As the revised guidelines were certified recently, as of the preparation of this SEIR, neither the two local jurisdictions (City of Merced or Merced County) nor the University has developed standards or thresholds for evaluating transportation impacts based on the new metrics. Therefore, this SEIR does not provide an impact evaluation based on VMT.

Local Plans and Policies

The University of California, a constitutionally created State entity, is not subject to municipal regulations of surrounding local governments for uses on property owned or controlled by the University that are in furtherance of the University's education purposes. However, the University may consider, for coordination purposes, aspects of local plans and policies for the communities surrounding a UC campus when it is appropriate and feasible, but it is not bound by those plans and policies in its planning efforts. This section summarizes the planning and policy documents that relate to the provision of transportation services in Merced County.

2018 Regional Transportation Plan/Sustainable Communities Strategy

The 2018 Regional Transportation Plan/ Sustainable Communities Strategy (RTP/SCS) provides a comprehensive long-range view of transportation issues, opportunities, and needs of Merced County. It

establishes the goals, objectives, and policies for future transportation improvements. The plan identifies the actions that should be taken and the funding needs and options available for successful implementation. Some of the relevant policies contained in the 2018 RTP/SCS include:

1. Highways, Streets, and Roads

Goal: Provider a safe and efficient regional road system that accommodates the demand for the movement of people and goods.

Objective 1.1 Maintain a Level of Service D on all regionally significant roads

Objective 1.2 Identify and prioritize improvements to the regional road system.

Objective 1.3 Use the existing street and road system in the most efficient possible manner to improve local circulation.

Objective 1.4 Monitor the impact of development on the regional road system.

2. Transit

Goal: Provide an efficient, effective, coordinated regional transit system that increases mobility for urban and rural populations, including transportation disadvantaged persons.

Objective 2.1 Meet all transit needs that are "reasonable to meet"

Objective 2.2 Increase transit ridership at a rate that exceeds annual population growth rate.

Objective 2.3 Promote citizen participation and education in transit planning.

Objective 2.4 Promote transit ridership to and from Mariposa County and Yosemite National Park.

6. Active Transportation (Bicycle & Pedestrian)

Goal: A regional transportation system for bicyclists and pedestrians. Create a safe, connected, and integrated regional transportation system for bicyclists and pedestrians.

Objective 6.1 Develop and construct bike and walkway facilities in urban areas and other communities where non-motorized systems do not currently exist.

Merced County General Plan

The 2030 Merced County General Plan Circulation Element includes policies to ensure that adequate access is provided and maintained for all county land uses. The following presents the General Plan Circulation Element policies relevant to transportation systems near the proposed campus.

Goal CIR-1: Maintain an efficient roadway system for the movement of people and goods that enhances the physical, economic, and social environment while being safe, efficient, and cost-effective.

Policy CIR-1.5 **County Level of Service Standards.** Implement a Countywide roadway system that achieves the following level-of-service (LOS) standards during peak traffic periods:

a) For roadways located within rural areas: LOS "C" or better.

b) For roadways located outside Urban Communities that serve as connectors between Urban Communities: LOS of "D" or better.

c) For roadways located within Urban Communities: LOS of "D" or better.

Goal CIR-3: Maintain a public transit system that provides an alternative to automobile travel, supports ridesharing, and meets the needs of the entire community.

Policy CIR-3.2 **Transit Improvements.** Continue to support transit efforts by the Merced County Association of Governments, Dial-A-Ride, UC Merced Transit, other public entities, private social service providers, and other various private charter services to improve and expand public transit throughout the County.

Goal CIR-4: Maintain and expand a safe, continuous, and easily accessible bicycle and pedestrian circulation system.

Policy CIR-4.1 **Bicycle and Pedestrian System**. Encourage a complete, safe, and interconnected bicycle and pedestrian circulation system that serves both commuter and recreational travel and provides access to major destinations within and between Urban Communities and cities. Prioritize Class I bicycle paths and separate trails between communities as part of the MCAG Regional Bikeway Plan. To the extent possible, use railroad and canal as right-of-way instead of streets to promote safety.

Merced Vision 2030 General Plan

The City's General Plan Circulation Element includes policies to ensure that adequate access is provided and maintained for all city land uses. Some of the relevant policies contained in the Merced Vision 2030 General Plan include:

Policy T-1.2 Coordinate circulation and transportation planning with pertinent regional, state, and federal agencies.

Policy T-1.6 Minimize adverse impacts on the environment from existing and proposed road systems.

Policy T-2.1 Provide for and Maintain a Major Transitway along "M" Street and Possibly along the Bellevue Road/Merced-Atwater Expressway and Campus Parkway corridors.

Policy T-2.3 Support a Safe and Effective Public Transit System.

Policy T-2.5 Provide Convenient Bicycle Support Facilities to Encourage Bicycle Use. Maintain and expand the community's existing bicycle circulation system.

Merced County Regional Commuter Bicycle Plan

The Merced County Regional Commuter Bicycle Plan, prepared by MCAG in October 2008, is intended to improve and enhance bicycle transportation in Merced County. Relevant goals from the plan include:

Goal 1 – Bicycle Safety: Provide a safe bicycle system as an alternative to vehicular travel. Establish and maintain routes that are designed to ensure safety. Establish a system that is secure for riders.

Objectives: Build and maintain street surfaces to avoid pavement conditions unsafe to bicyclists. As collision events and bicycle injuries/accidents are recorded, identify possible remedial improvements.

Goal 2 – Bicycle Education: Encourage bicycling through education. Provide literature and up-to-date bikeway maps for the public promoting safe bicycle use.

Objectives: Promote safe bicycle use to riders as well as car drivers. Cooperate with other agencies and groups to promote and educate the public regarding bicycle facilities in the plan area. Establish helmet programs that educate and encourage safe bicycle use. Support bicycle safety awareness through public information and education programs.

Goal 3 – Connectivity/ Accessibility: Accommodate bicycling as part of the County's multi-modal transportation system. Establish and maintain an integrated network of bicycle facilities to support bicycle commuting. Establish and maintain an integrated network of bicycle facilities to support recreational bicycling. Establish and maintain an integrated network that connects to other countries.

Objectives: Establish right-of-way requirements that accommodate the complete bikeway system, including sidewalks and multi-use paths throughout Merced County. Maintain a bicycle planning committee to oversee bicycle transportation planning and implementation projects for the purposeful movement of people and goods by the most efficient means available. Plan in coordination with the development of UC Merced. Promote bicycle routes to regional recreational and commuter destinations. Link trip origins and destinations with on-street bikeways designed to serve transportation and recreation purposes. Integrate bicycling into the transit system with bus mounted bicycle carriers. Establish nodes of connectivity to encourage tourism and commuting. Devise lane specifications for specific bicycle rider classifications. Include funding for regular facility expansion, maintenance, and repair, as well as funding to review development and zoning proposals for impact on bicycle mobility in the annual local operations and maintenance budgets. Maintain a local capital improvement plan that provides regular funding

for the bicycle program to acquire right of way, to construct new facilities, to retrofit inadequate facilities and to refurbish older facilities.

Short Range Transit Plan

The Short Range Transit Plan, prepared by MCAG in June 2017, has the following purposes: evaluate current transit services; update system goals, objectives, and performance standards; describe future transit needs; and present a service plan and financial plan. The goals and objectives contained in the Plan are listed below.

- Provide increased mobility in Merced County
- Provide safe and high quality service
- Provide cost-effective and efficient service

Existing Local Agreements

UC Merced Chancellor Letter to Merced County, dated April 6, 2009

On April 6, 2009, UC Merced Chancellor sent a letter to the County (Kang Letter), summarizing the terms and conditions for certain future roadway improvements as part of campus development under the 2009 LRDP. The Kang Letter identifies specific improvements for which the University would fund its proportional share, based on specified triggering events related to impacts identified in the 2009 LRDP EIS/EIR that would have resulted from the build-out of the 2009 LRDP. In addition, the Kang Letter states "[t]he premise of the financial commitments to these specific roadway and intersection improvements is that it is in the mutual interest of the University, the City and the County that these adjacent infrastructure improvements are planned and funded as their need arises."

Merced County Roadway Repair Agreement, dated October 21, 2016

The University entered into a Roadway Repair Agreement with Merced County on October 21, 2016, relating to an encroachment permit issued to the University for temporary construction access connecting to Lake Road to accommodate construction of the UC Merced 2020 Project.

UC Merced Revised 2020 Project Transportation Improvement Funding Agreement

The University is subject to the *UC Merced Revised 2020 Project Transportation Improvement Funding Agreement* (Transportation Agreement), entered into by the University and the City of Merced in 2016. The Transportation Agreement provides that the University shall fully pay the cost of intersection

improvements at Lake/Bellevue Road and Lake Road/Yosemite Avenue, when LOS D is reached, design is approved, and the notice to proceed with construction is issued. Improvements at both intersections include installation of a traffic signal. The University has completed its mitigation obligation for the Lake/Bellevue Road intersection and a traffic signal has been installed.

The Transportation Agreement also includes an obligation that the University pay for the University Community Properties' share of engineering and environmental analysis for the widening of Bellevue Road, subject to future reimbursement once that area develops. This obligation will be triggered when the average daily traffic (ADT) on Bellevue Road reaches 9,000 vehicles and the City comes forth with a Bellevue widening project.

With regard to Campus Parkway Phase I (SR 99 to E. Childs Avenue), the University agreed to and paid $750,000 in 2016. With regard to Campus Parkway Phase II (E. Childs Avenue to SR 140), the University committed to paying its proportionate share, less any grant funding. Construction of that segment of the roadway has been fully funded by the State.

Notwithstanding the above, the University will not be responsible for the payment of any other proportionate fees for transportation improvements that were included in the mitigation measures for the 2009 LRDP EIS/EIR, as those mitigation measures are superseded by the transportation mitigation measures in this SEIR. In addition, the Transportation Agreement does not address the University's obligations for additional transportation improvements that may be needed for development beyond the Revised 2020 Project.

4.8.4 Impacts and Mitigation Measures

Significance Criteria

This SEIR uses significance criteria derived from Appendix G of the *State CEQA Guidelines*. For the purposes of this SEIR, impacts related to transportation would be significant if implementation of the 2020 LRDP would result in any of the following: Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. For the purposes of this SEIR, the following criteria are applied.

Roadway System

- Cause the deterioration of a signalized intersection from LOS D or better under baseline conditions to LOS E or LOS F under With Project conditions;
- Cause an increase in average delay of 5 or more seconds for a signalized intersection operating at LOS E or LOS F under baseline conditions;

- At all-way stop controlled intersections, cause deterioration of the intersection from LOS D or better to E or F; or, if the intersection is already operating at LOS E or F without the Project, add five or more seconds of delay;

- At side-street stop-controlled intersections, cause the worst approach to deteriorate from LOS D or better to E or F; or, if the worst approach is already operating at LOS E or F without the Project, add five or more seconds of delay to the worst approach;

- Increase the volume-to-capacity ratio by more than 0.01 on a freeway segment operating at LOS E (V/C=0.90) or worse;

Transit System

- Disrupt existing transit services or facilities, interfere with planned transit services or facilities, or conflict with adopted transit system plans.

Bicycle System

- Disrupt existing bicycle facilities, interfere with planned bicycle facilities, or conflict with adopted bicycle system plans.

Pedestrian System

- Disrupt existing pedestrian facilities, interfere with planned pedestrian facilities, or conflict with adopted pedestrian system plans.

- Conflict or be inconsistent with *State CEQA Guidelines* Section 15064.3, subdivision (b). For the purposes of this SEIR, this impact criteria is not assessed because the referenced *State CEQA Guidelines* section is not required to be implemented prior to July 1, 2020 and neither the City of Merced, Merced County, nor the University have developed standards or thresholds for VMT impact evaluation.

- Substantially increase hazards due to a geometric design feature (e.g. sharp curves or dangerous intersections) or incompatible uses.

- Result in inadequate emergency access.

Methodology

Baseline for Transportation Analysis

CEQA requires that the impacts of a project be evaluated relative to the conditions that exist at the time that CEQA review for the project is commenced, which is typically when the notice of preparation of the EIR is published. However, courts have held that a lead agency may elect to forego analyzing the project's impact against existing conditions in favor of a more appropriate future year condition, as long as the lead agency can demonstrate that an analysis based on existing conditions would be uninformative

or misleading to the decision makers and the public (*Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* 2013). The 2020 LRDP is a long-range planning document which plans for the development of the campus between 2020 and 2030. The plan provides for the development of 1.83 million gross square feet of building space that would accommodate the projected growth in enrollment and employment. However, this space would not be built immediately upon approval of the LRDP. In fact, at this time, there are no specific projects that UC Merced plans to implement soon after the 2020 LRDP is approved. The building space would be developed over time, taking into account space needs, availability of funding, and other constraints. Further, there is no guarantee that all of the space would be built or the planned enrollment growth would occur. An analysis of the 2020 LRDP's transportation impacts relative to existing conditions in 2019 would not be meaningful and would in fact be misleading. Therefore, consistent with the guidance set forth by the *Smart Rail* ruling, the transportation impacts of the 2020 LRDP are analyzed by adding the project-related traffic to the background traffic that would exist in 2030, to determine the change in the traffic conditions due to the project.

Campus Development Phases

Traffic associated with three phases of campus development is estimated and evaluated in the analysis below.

- Campus development that is currently underway and is planned to be completed by 2020 is referred to below as the "2020 Project." Upon completion of the 2020 Project, although the campus will have facilities to accommodate an enrollment level of about 10,000 students, based on enrollment projections, about 9,700 students are projected to be enrolled at UC Merced by 2020.

- Campus development under the 2020 LRDP anticipated to occur between 2020 and 2030 is referred as the "LRDP Project." With the implementation of the 2020 LRDP, the campus will have facilities to accommodate an enrollment level of about 15,000 students.

- Campus development between 2030 and 2035 (year of cumulative impact analysis) is referred to as the "2035 Campus Scenario." For purposes of analysis of cumulative impacts, this SEIR assumes that by 2035, the campus will have facilities to accommodate an enrollment level of about 17,500 students.

Project Trip Generation

Trip generation for campus development through 2030 was estimated in the 2009 UC Merced LRDP/University Community EIS/EIR (2009 LRDP EIS/EIR) using trip generation rates from other campuses deemed similar to the future UC Merced, as well as ITE Trip Generation Manual rates. This is because at that time, the UC Merced campus was relatively small at only 2,500 students, and trip rates derived directly from traffic counts entering and leaving the campus were not thought to be sufficiently representative of the future campus' vehicle trip generating characteristics. A daily trip generation rate of

2.08 trips per student was used in the 2009 LRDP EIS/EIR, derived from comparable campus trip rates (UC Davis and UC Santa Cruz), and peak hour traffic was calculated with the MCAG's travel demand model.

In 2017, at almost 8,000 enrolled students, trip generation rates based on actual campus traffic counts are a more reliable predictor of future characteristics at 15,000 and 17,500 students. Therefore, trip generation rates were derived from peak period counts taken in November 2017 at the intersection of East Bellevue Road/Lake Road. These counts were adjusted to screen out trips to and from Lake Yosemite, using multi-day counts from March 2017 on Lake Road north of Bellevue Road, Ranchers Road, and Scholars Lane. The total campus trip generation was then split into estimated trips generated by commuter students, resident students, and by faculty/staff, using parking lot-specific counts to capture the rough proportion of trips generated by these three groups. The campus trip generation rates are shown below:

Commuter Student Trip Rates

- Daily: 1.57 trips per student (50 percent inbound, 50 percent outbound)
- AM Peak Hour: 0.14 trips per student (86 percent inbound, 14 percent outbound)
- PM Peak Hour: 0.15 trips per student (27 percent inbound, 73 percent outbound)

Resident Student Trip Rates

- Daily: 0.52 trips per student (50 percent inbound, 50 percent outbound)
- AM Peak Hour: 0.04 trips per student (12 percent inbound, 88 percent outbound)
- PM Peak Hour: 0.05 trips per student (72 percent inbound, 28 percent outbound)

Faculty/Staff Trip Generation Rates

- Daily: 2.42 trips per faculty/staff member (50 percent inbound, 50 percent outbound)
- AM Peak Hour: 0.21 trips per faculty/staff member (90 percent inbound, 10 percent outbound)
- PM Peak Hour: 0.23 trips per faculty/staff member (26 percent inbound, 74 percent outbound)

Table 4.8-5, 2020 Project Remaining Development Trip Generation Estimates, summarizes the daily and peak hour trips for the campus with an enrollment level of 9,700 students in 2020. **Table 4.8-6, LRDP Project (2030) Trip Generation Estimates**, presents the daily and peak hour trips for the LRDP project (growth from 9,700 students to 15,000 students). **Table 4.8-7, 2035 Campus Scenario Trip Generation Estimates**, presents the daily and peak hour trips for the projected campus growth from 2030 to 2035 (from 15,000 students to 17,500 students). Detailed trip generation calculations are provided in **Appendix 4.8**.

Table 4.8-5
2020 Project Remaining Development Trip Generation Estimates

Population	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	
New Student Commuters	(31)	(4)	(36)	(11)	(28)	(39)	(395)[a]
New Student Residents	10	74	84	66	26	92	1,036
New Faculty/Staff	35	5	40	12	31	44	459
Total	14	74	89	67	30	97	1,101

Source Fehr & Peers August 2019.
Notes:
This table presents trip generation associated with student enrollment growth from 7,967 students to 9,700 students.
See the Technical Appendix for detailed trip generation calculations.
a. There are negative commuter trips in the 2020 Project trip generation because that portion of the development builds enough housing to serve some existing commuting students.

Table 4.8-6
LRDP Project (2030) Trip Generation Estimates

Population	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	
New Student Commuters	358	51	409	127	320	447	4,540
New Student Residents	13	89	101	80	32	111	1,252
New Faculty/Staff	200	28	229	71	179	250	2,614
Total	571	168	739	277	531	808	8,406

Source Fehr & Peers August 2019.
Notes:
This table presents trip generation associated with student enrollment growth from 9,700 students to 15,000 students.
See the Technical Appendix for detailed trip generation calculations.

Table 4.8-7
2035 Campus Scenario Trip Generation Estimates

Population	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	
New Student Commuters	161	23	183	57	144	200	2,035
New Student Residents	6	44	51	40	16	56	626
New Faculty/Staff	104	15	119	37	93	130	1,364
Total	271	82	353	134	253	387	4,025

Source Fehr & Peers August 2019.
Notes:
This table presents trip generation associated with student enrollment growth from 15,000 students to 17,500 students.
See the Technical Appendix for detailed trip generation calculations.

It is noted that, based on the counts at the intersection of Lake Road and East Bellevue Road, the campus traffic peak hours are slightly different than the citywide traffic peak hours as seen in the study area intersection counts: the campus peak hours are 8:00 – 9:00 AM and 4:45 – 5:45 PM, whereas the citywide peak hours are generally 7:45 – 8:45 AM and 4:30 – 5:30 PM. However, for purposes of the intersection impact analysis, the campus peak hour trip generation is overlaid on the citywide peak hour traffic volumes to ensure a conservative analysis.

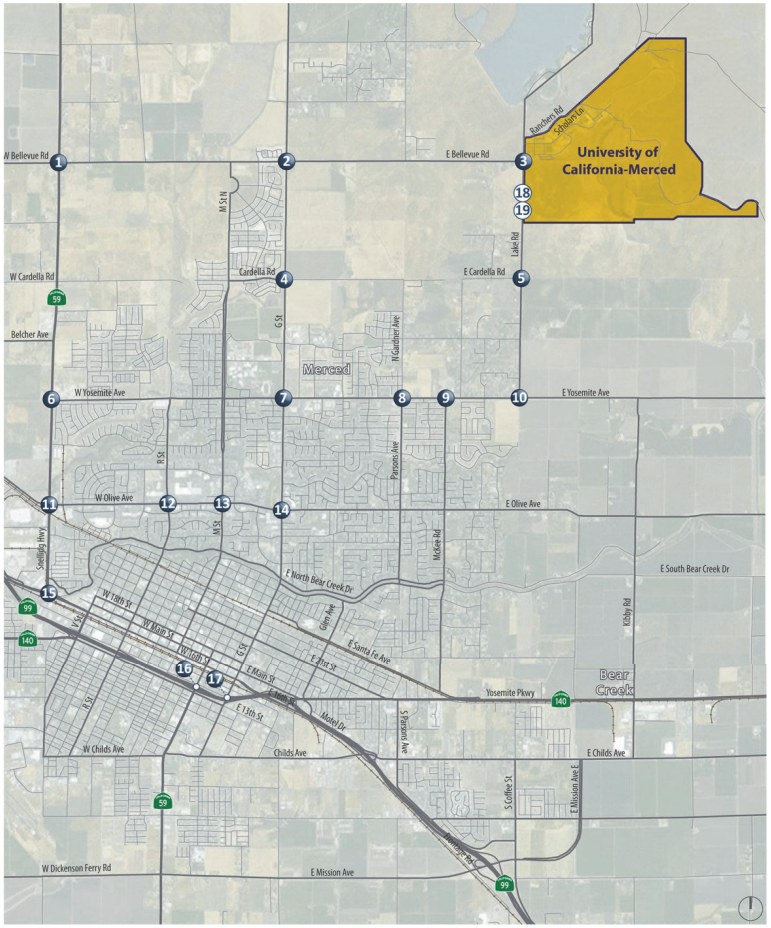
Trip Distribution and Assignment

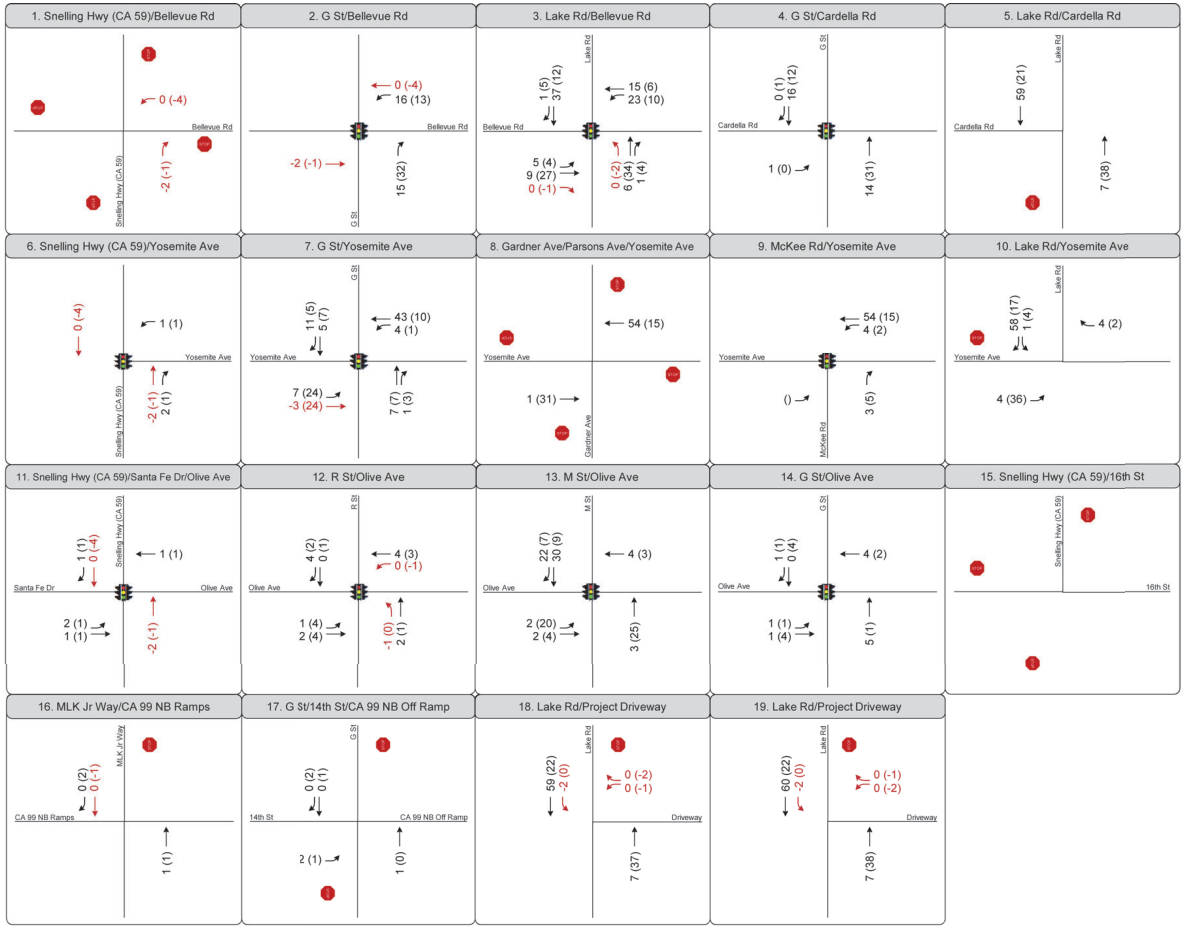
The trip distribution for the LRDP Project and the 2035 Campus Scenario is based on a GIS analysis of the locations of student and staff residences within Merced and the greater region, provided by UC Merced staff. The estimated student and staff trips were distributed to/from the various residence locations, using a Vistro trip assignment model. Trips were distributed 30 percent to Bellevue Road and 70 percent to Lake Road for both inbound and outbound trips, based on the expected use of the two roadways given residence patterns, the relative congestion on the two roadways in the vicinity of the campus, and the two additional access points on Lake Road south of Bellevue Road which are planned under the 2020 LRDP (one of which will be completed as part of the 2020 Project). Trips were further distributed to various zones within the City and in other areas outside the City, based on the residence data. The residential data is provided in **Appendix 4.8**.

Trips were assigned to the four campus access points based on the traffic consultant's best estimate of the relative parking accessibility via each access point under the LRDP Project (note that parking distribution under the 2020 LRDP has not been defined):

- Ranchers Road/Scholars Lane: 50 percent of residential trips, 50 percent of commuter trips using East Bellevue Road, 25 percent of commuter trips using Lake Road
- East Bellevue Road Extension: 50 percent of residential trips, 50 percent of commuter trips using East Bellevue Road, 25 percent of commuter trips using Lake Road
- Driveway #1 (intersection 18): 25 percent of commuters using Lake Road
- Driveway #2 (intersection 19): 25 percent of commuters using Lake Road

The resulting vehicle trips generated by the 2020 Project are shown in **Figure 4.8-4, 2020 Project Trip Assignment**, and the vehicle trips generated by the LRDP Project (post-2020 Project growth to 15,000 students) are shown in **Figure 4.8-5, LRDP Project (2020-2030 Growth) Trip Assignment**. The vehicle trips generated by the projected additional growth to 17,500 students by the year 2035 are shown in **Figure 4.8-6, 2035 Campus Project (2030-2035 Growth) Trip Assignment**.





Note: This figure shows the trips associated with completion of the 2020 Project, with growth from 7,967 enrolled students to 9,700 enrolled students.

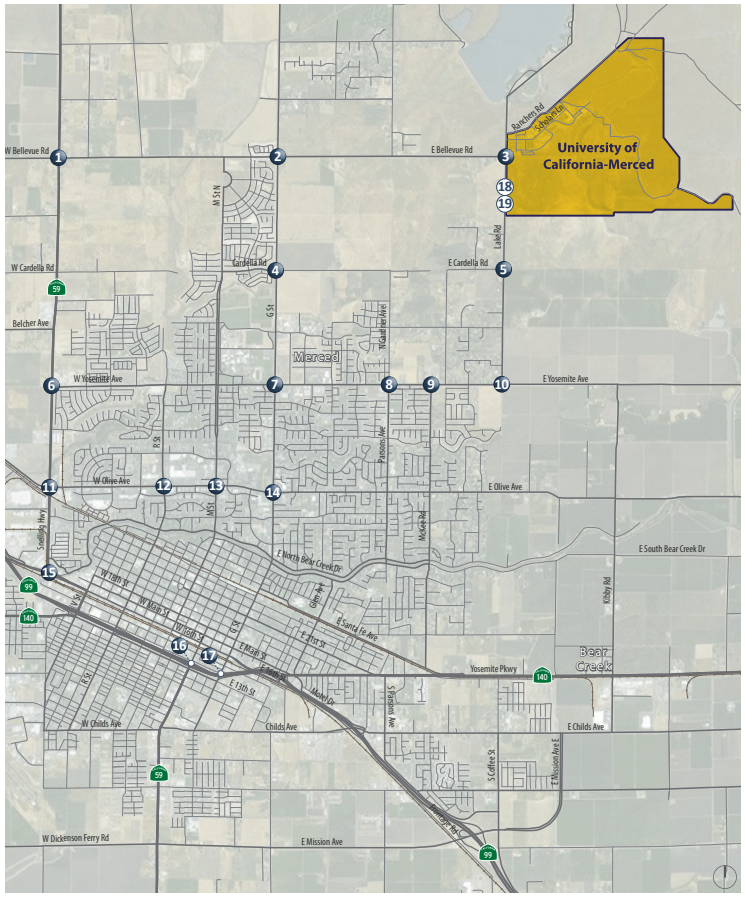
XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

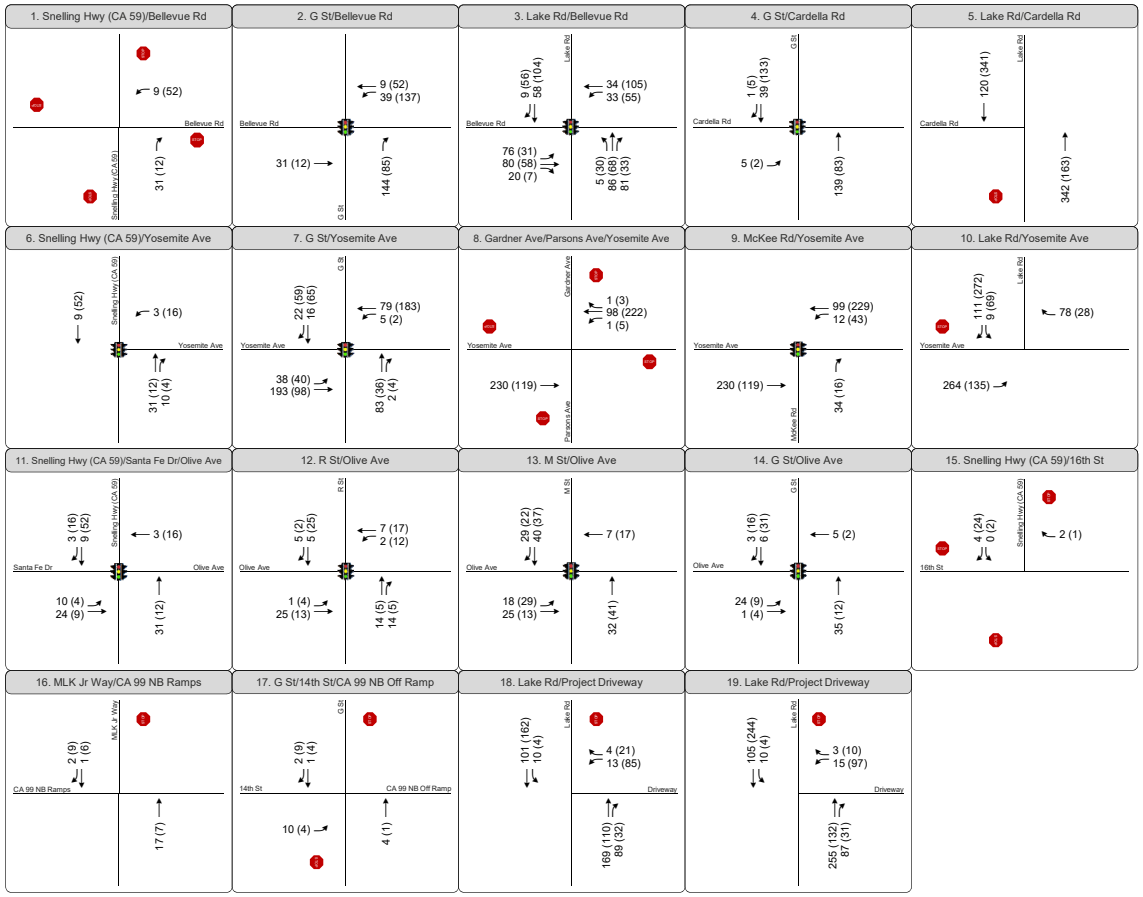
Project Site # Study Intersection

SOURCE: Fehr & Peers, 2019

FIGURE **4.8-4**

2020 Project Trip Assignment





Note: This figure shows the trips associated with growth from 9,700 students (at completion of the 2020 Project) to 15,000 students.

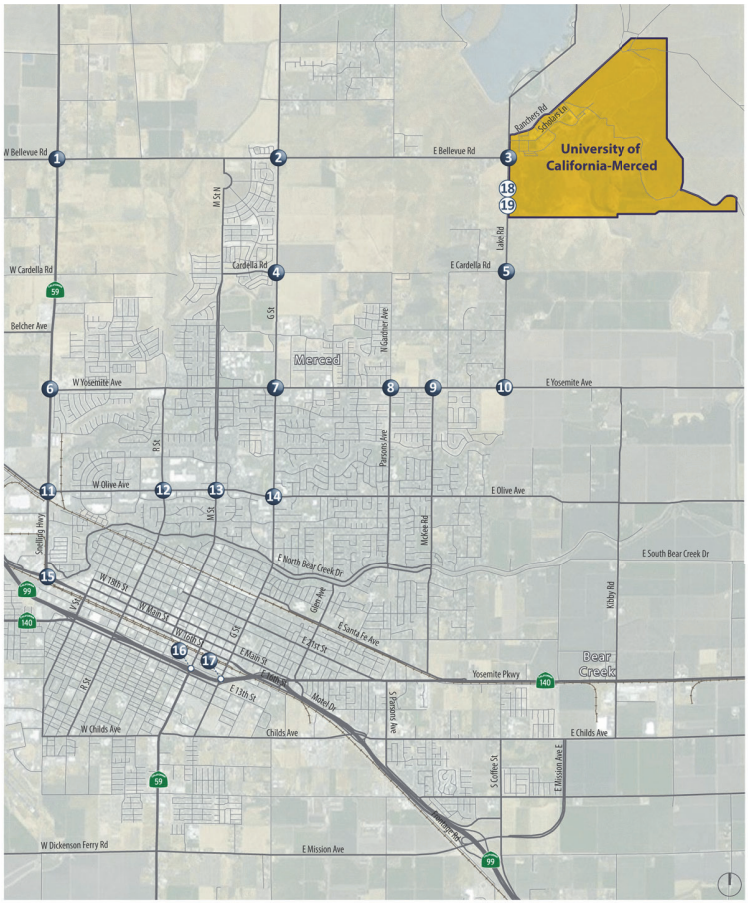
XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

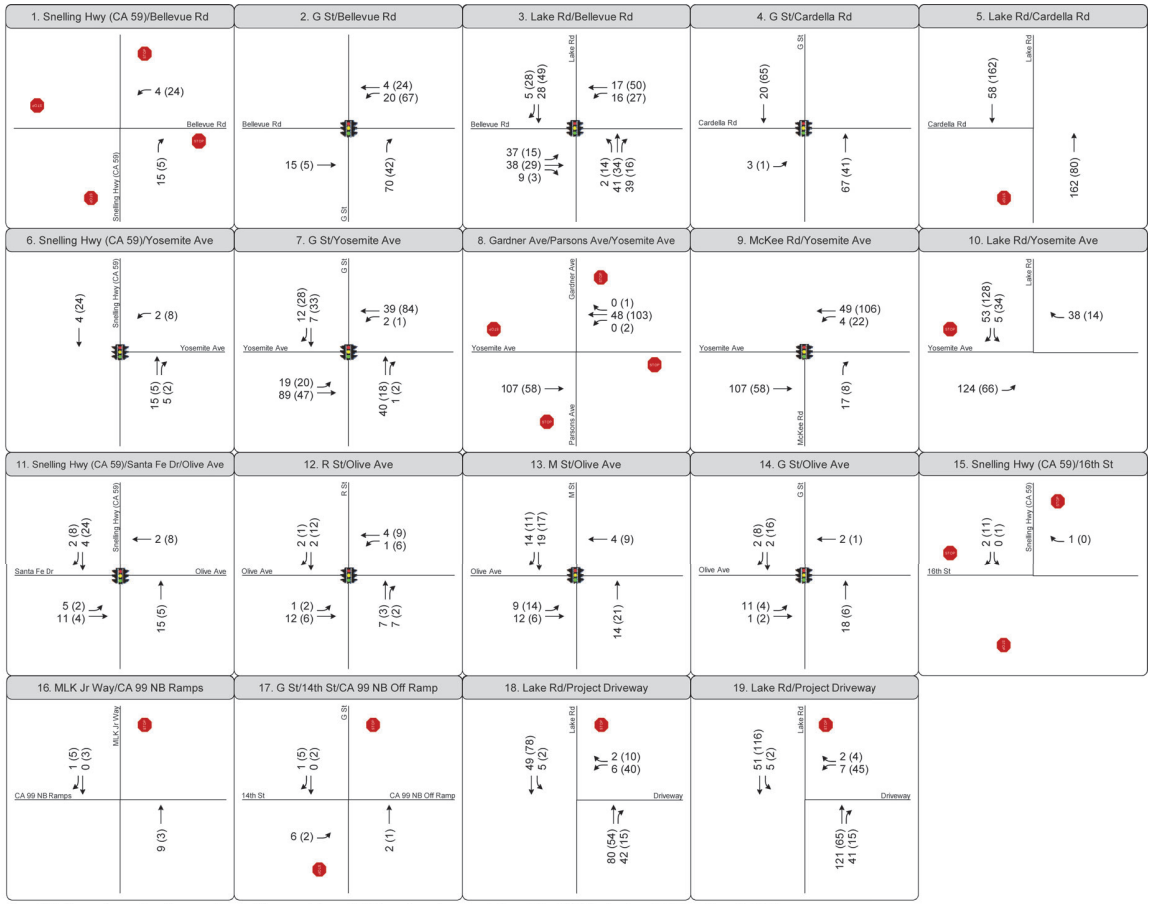
Project Site # Study Intersection

SOURCE: Fehr & Peers, 2019

FIGURE **4.8-5**

LRDP Project (2020-2030 Growth) Trip Assignment





Note: This figure shows the trips associated with growth from 15,000 students (at completion of the LRDP Project) to 17,500 students in 2035.

XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Site # Study Intersection

SOURCE: Fehr & Peers, 2019

FIGURE **4.8-6**

2035 Campus Project (2030-2035 Growth) Trip Assignment

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4.8.5 LRDP Impacts and Mitigation Measures

LRDP Impact TRANS-1: Implementation of the 2020 LRDP would significantly affect study area intersections during peak commute hours under 2030 plus project conditions. ***(Significant; Significant and Unavoidable)***

Campus development through 2020 is currently underway under the 2020 Project which will develop adequate additional facilities to accommodate an enrollment level of 9,700 students. The proposed 2020 LRDP is designed to guide the development of the campus between 2020 and 2030, so that by 2030, the campus can accommodate an enrollment level of 15,000 students. Further, the 2020 LRDP is a plan to guide campus development, and not a development project. Assuming that campus enrollment increases as currently projected, the full effects of the 2020 LRDP would be experienced by 2030 when campus enrollment increases to 15,000 students. Therefore, the transportation impacts of the 2020 LRDP on the study area intersection operations are evaluated under 2030 conditions below.

Background Traffic Growth from Approved and Anticipated Development

As a first step, growth in background traffic from existing conditions through cumulative year 2035 was estimated. The City of Merced and Merced County provided a list of approved and planned projects expected to be constructed by 2035. A list of these projects is provided in **Table 4.0-1**. Vehicle trip generation for the approved and anticipated development was estimated using average trip generation rates and trip generation equations for the proposed land uses from ITE's Trip Generation (9th Edition), and, where available, the transportation impact assessments prepared for specific developments. The total trip generation of the approved and anticipated development through the year 2035 is estimated at 3,860 AM peak hour trips and 7,053 PM peak hour trips. To estimate the total trip generation in the year 2030, a straight-line assumption was used between the year 2017 (when the existing conditions counts were taken) and 2035 (when all development would be constructed). Thus, the total trip generation for approved and anticipated development in 2030 is estimated at 2,730 AM peak hour trips and 4,980 PM peak hour trips.

Traffic generated by the approved and anticipated development through the year 2030 was assigned to the roadway network based on trip distribution information derived from the MCAG Travel Demand Model. Specifically, several 'select zone' runs were used to determine the general distribution of traffic from residential and commercial traffic analysis zones; these distribution patterns were then manually applied to the approved/anticipated development traffic, using the manual traffic assignment software Vistro. The estimated peak hour intersection turning movements resulting from approved and

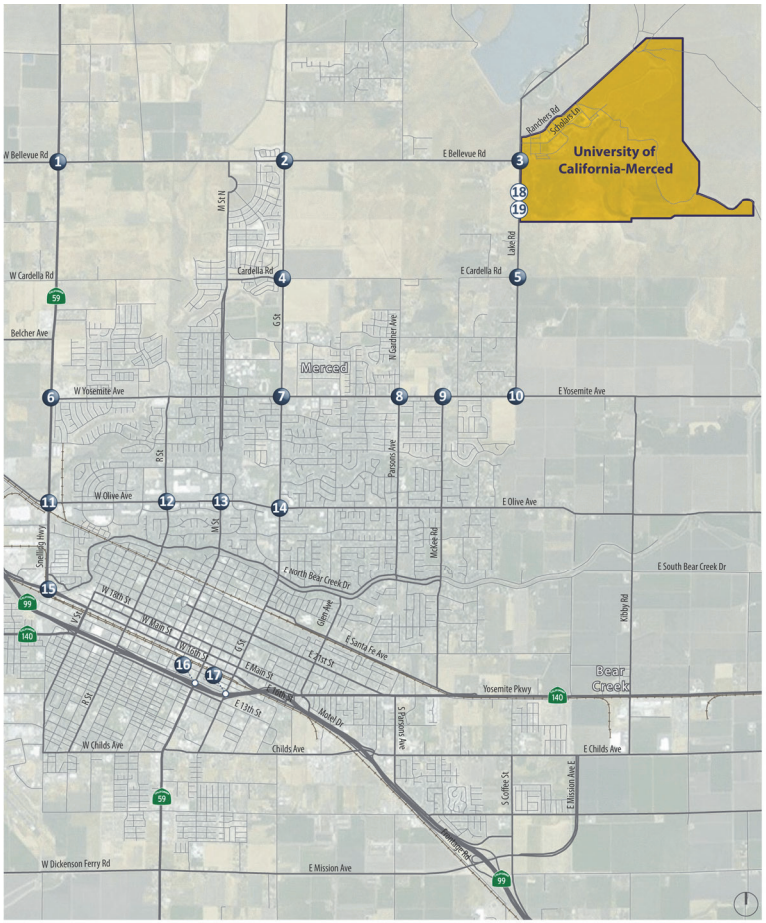
anticipated development to 2030 are shown in **Figure 4.8-7, Year 2030 Approved/Anticipated Development Trip Assignment**.

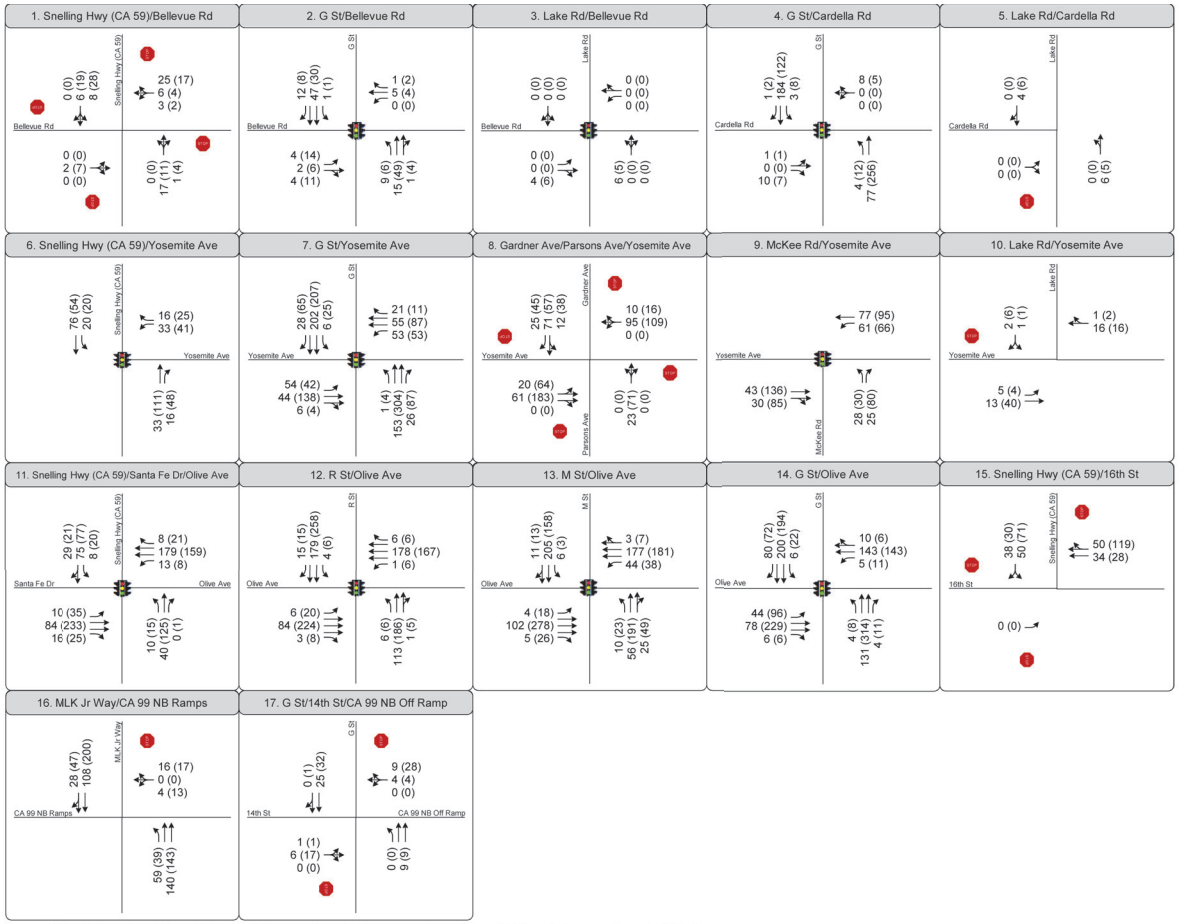
It is important to note that the trip generation and assignment process in this analysis is conservative for the following reason: it is expected that some of the new trips from housing development in the City will be made by new Campus commuters. This analysis does not take a credit for this fact, but instead assigns all new development trips to the network along with all LRDP Project (campus) trips. This essentially leads to some trips being double counted. The extent of the double counting is difficult to estimate. It should therefore simply be noted that the analysis is clearly conservative.

2030 Roadway Network

In addition to the signalization of East Bellevue Road/Lake Road which was completed in 2018, the 2030 roadway network includes the completion of Campus Parkway from its current terminus at East Childs Avenue north to East Yosemite Avenue. The construction of the segment to SR 140 ("Segment 2") has commenced, and the segment from SR 140 to Yosemite Avenue ("Segment 3") is in the construction bidding process. It is not anticipated that Campus Parkway would extend north of Yosemite Avenue by 2030 or 2035, the years of analysis used in this SEIR. It should be noted that Merced County 2018 RTP/SCS Tier I Project List includes only Segments 2 and 3 of the Campus Parkway and does not include the segment north of Yosemite Avenue (MCAG 2018). The analysis is based on the assumption that Lake Road will continue to be a through road up to Bellevue Road and to Lake Yosemite Regional Park and would continue to be used to access the campus from the south.

Based on the estimated campus trip distribution and assignment, which in turn is based on a GIS analysis of the locations of student and staff residences within Merced and the greater region, relative few campus trips are expected to use Campus Parkway – generally fewer than 50 peak hour/peak direction trips. Most of these trips would be through trips at the intersections along Campus Parkway connecting to SR 99, which generally affect intersection capacity to a lesser degree than turning movements. The forecasted intersection operations with completion of Campus Parkway up to East Yosemite Avenue were projected to be LOS D or better in the *Merced Campus Parkway FEIR* (2005). Due to the low number of campus trips expected to use Campus Parkway, and the projected acceptable operations for the major intersections along Campus Parkway, intersections along Campus Parkway were not selected for analysis in this document.





Source: City of Merced and Merced County. 2030 growth projections were derived from 2035 projections, using a straight-line assumption, by Fehr & Peers.

XX (YY) AM (PM) Peak Hour Traffic Volumes | Signalized Intersection | Stop Sign

Project Site | # Study Intersection

SOURCE: Fehr & Peers, 2019

FIGURE **4.8-7**

Year 2030 Approved/Anticipated Development Trip Assignment

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For the 2030 With Project case, two new access intersections are assumed on Lake Road, approximately 750 feet and 1,500 feet south of the Bellevue Road intersection, respectively, consistent with the LRDP circulation diagram. At both of these intersections, it was assumed that a 300-foot long southbound left-turn pocket lane would be provided, and that separate left-turn and right-turn lanes would be provided on the westbound approach.

2030 No Project and With LRDP Project Traffic Volumes

Figure 4.8-8, Year 2030 No Project Traffic Volumes, Lane Configurations and Traffic Controls, shows the 2030 No Project traffic volumes, which result from adding the volumes from approved/anticipated development to existing traffic volumes. **Figure 4.8-9, Year 2030 With LRDP Project Traffic Volumes, Lane Configurations and Traffic Controls**, shows the 2030 With LRDP Project traffic volumes, which result from adding 2020 Project volumes and LRDP Project volumes to Year 2030 No Project volumes.

2030 Intersection Levels of Service

Peak hour intersection operations for the 2030 with LRDP Project scenario are shown in **Table 4.8-8 Intersection Levels of Service – 2030 No Project and 2030 with LRDP Project.** The following intersections are projected to operate deficiently in at least one peak hour:

- Intersection #1: West Bellevue Road/Highway 59
- Intersection #2: Bellevue Road/G Street
- Intersection #3: East Bellevue Road/Lake Road
- Intersection #7: G Street/Yosemite Avenue
- Intersection #8: East Yosemite Avenue/Parsons Avenue/North Gardner Avenue
- Intersection #10: East Yosemite Avenue/Lake Road
- Intersection #13: West Olive Avenue/M Street
- Intersection #14: Olive/G Street
- Intersection #15: West 16th Street/Highway 59

At intersections #8, #15 and #16, the peak hour signal warrants are met under 2030 No Project conditions in one or both peak hours and would continue to be met under 2030 With LRDP Project conditions. At intersection #10, the addition of LRDP Project traffic causes the peak hour signal warrant to be met in both peak hours.

Table 4.8-8
Intersection Levels of Service - 2030 No Project and 2030 with LRDP Project

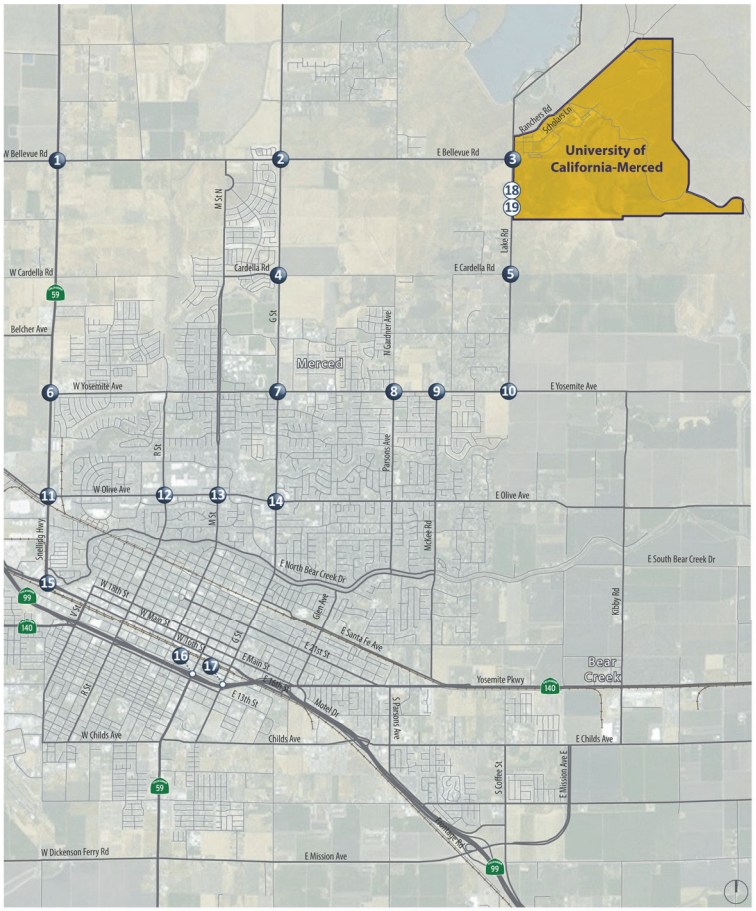
Intersection	Traffic Control	Peak Hour[1,2]	2030 No Project Conditions[3]		2030 with LRDP Project Conditions[3]	
			Delay (Seconds)	LOS	Delay (Seconds)	LOS
1. West Bellevue Road/Highway 59	AWS	AM	**77.6**	**F**	**83.4**	**F**
		PM	14.2	B	16.4	C
2. Bellevue Road/G Street	Signal	AM	40.7	D	**60.8**	**E**
		PM	22.0	C	26.8	C
3. East Bellevue Road/Lake Road	Signal	AM	10.9	B	37.5	D
		PM	9.4	A	**>120**	**F**
4. Cardella Road/G Street	Signal	AM	21.1	C	30.5	C
		PM	7.4	A	7.9	A
5. East Cardella Road/Lake Road	SSS	AM	0.4 (13.5)	A (B)	0.4 (24.9)	A (C)
		PM	0.2 (12.6)	A (B)	0.2 (21.2)	A (C)
6. West Yosemite Avenue/Highway 59	Signal	AM	16.2	B	17.3	B
		PM	13.8	B	14.2	B
7. Yosemite Avenue/G Street	Signal	AM	36.7	D	41.9	D
		PM	48.7	D	**56.6**	**E**
8. East Yosemite Avenue/Parsons Avenue/North Gardner Avenue	AWS	AM	**71.9**	**F**	**>120**	**F**
		PM	**75.5**	**F**	**>120**	**F**
9. East Yosemite Avenue/McKee Road	Signal	AM	10.3	B	11.4	B
		PM	10.7	B	12.8	B
10. East Yosemite Avenue/Lake Road	SSS	AM	6.3 (17.1)	A (C)	34 **(>120)**	**D (F)**
		PM	10.3 (18.4)	B (C)	**>120(>120)**	**F (F)**
11. West Olive Avenue/ Highway 59	Signal	AM	48.3	D	49.5	D
		PM	50.5	D	51.1	D
12. West Olive Avenue/R Street	Signal	AM	47.5	D	47.6	D
		PM	**61.3**	**E**	**62.2**	**E**
13. West Olive Avenue/M Street	Signal	AM	50.9	D	53.9	D
		PM	**63.0**	**E**	**68.0**	**E**
14. Olive Avenue/G Street	Signal	AM	**61.2**	**E**	**66.7**	**E**
		PM	**67.9**	**E**	**71.9**	**E**
15. West 16th Street/Highway 59	AWS	AM	**108.0**	**F**	**109.9**	**F**
		PM	**>120**	**F**	**>120**	**F**
16. SR 99 Northbound Ramps/MLK Jr. Way	SSS	AM	5.1 (32.5)	A (D)	5.2 (34.4)	A (D)
		PM	6.1 **(68.2)**	A **(F)**	6.3 **(73.0)**	A **(F)**
17. SR 99 Northbound Off-Ramp/West 14th Street/G Street	SSS	AM	2.7 (21.7)	A (C)	3 (23.4)	A (C)
		PM	3.0 (30.6)	A (D)	3.2 (32.6)	A (D)
18. Lake Road/Project Driveway #1	SSS	AM	--	--	0.4 (17.6)	A (C)
		PM			2.6 (11.4)	A (B)
19. Lake Road/Project Driveway #2	SSS	AM	-	--	0.4 (24.5)	A (C)
		PM			2.4 (13.1)	A (B)

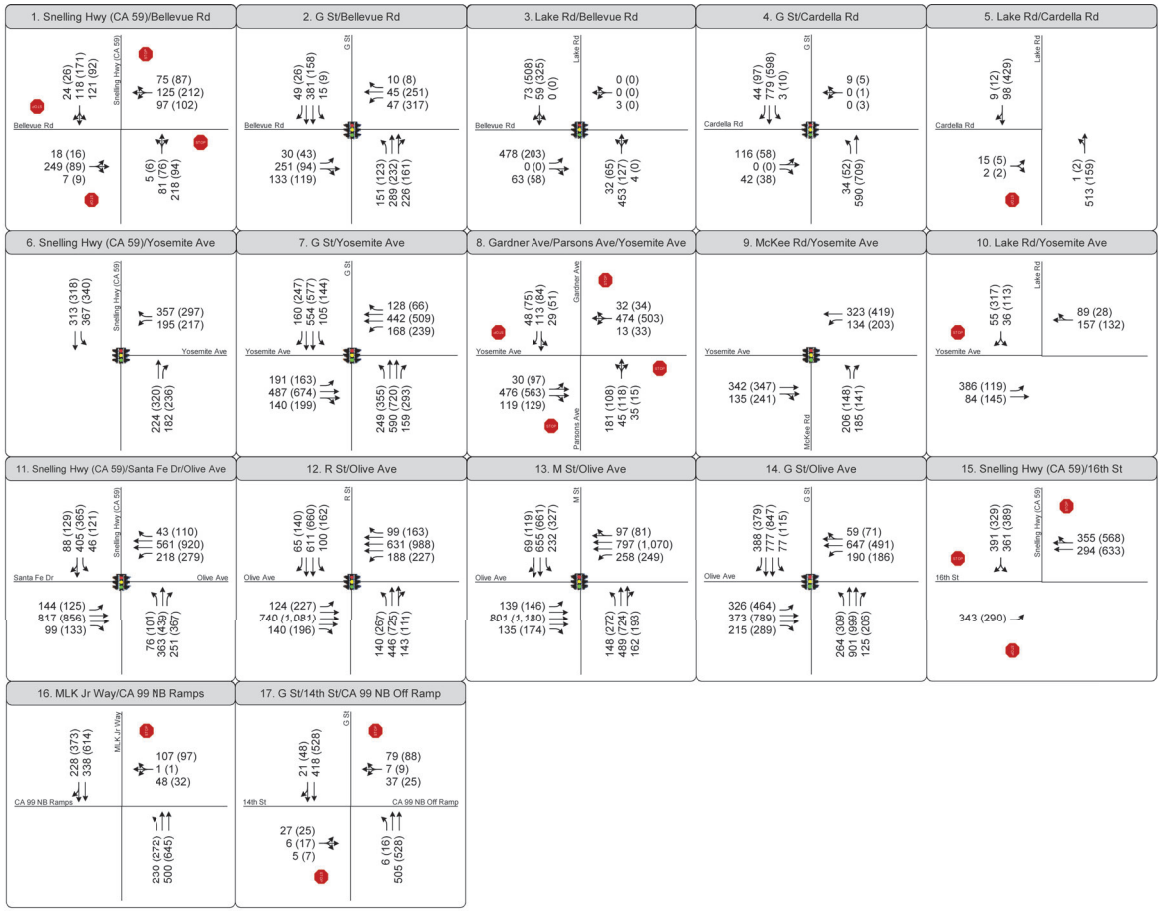
Source: Fehr & Peers August 2019.

[1] *Signal = signalized intersection; AWS=all-way stop; SSS=side street stop.*

[2] *For side-street stop-controlled intersections, two service levels are listed: Average intersection LOS (LOS for worst side-street movement).*

[3] ***Bold** indicates below-standard service level. Shaded indicates a significant impact.*





Note: This figure includes traffic volumes associated with approved and anticipated projects through the year 2030.

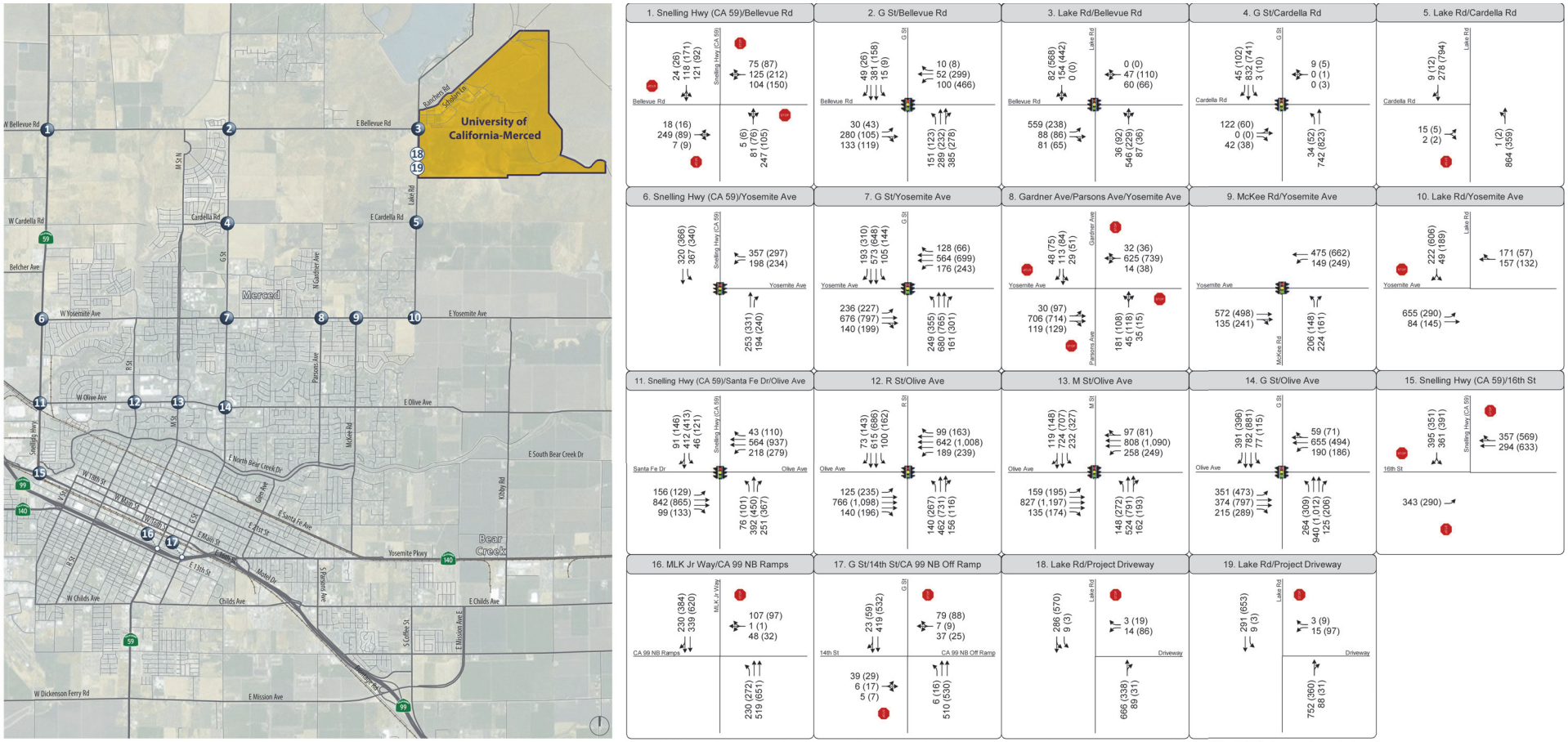
XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Site # Study Intersection

SOURCE: Fehr & Peers, 2019

FIGURE **4.8-8**

Year 2030 No Project Traffic Volumes, Lane Configurations and Traffic Controls



Note: This figure includes traffic volumes associated with approved and anticipated projects through the year 2030, completion of the 2020 Project, and completion of the LRDP Project (additional campus growth to 15,000 students).

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Study Intersection

With Project Study Intersection

SOURCE: Fehr & Peers, 2019

FIGURE **4.8-9**

Year 2030 With LRDP Project Traffic Volumes, Lane Configurations and Traffic Controls

Based on the significance thresholds presented above in **Section 4.8.4**, the following nine intersections would be significantly affected by the traffic added by the project:

- **Intersection #1, West Bellevue Road/Highway 59.** As shown in **Table 4.8-8**, the intersection of West Bellevue Road and Highway 59 would operate at LOS F without the proposed project during the AM peak hour and the addition of project traffic would add more than five seconds to the intersection delay.

- **Intersection #2, Bellevue Road/G Street.** As shown in **Table 4.8-8**, the addition of traffic from the proposed project would cause the operation of the intersection of Bellevue Road/G Street to deteriorate from LOS D in the AM peak hour to LOS E.

- **Intersection #3, East Bellevue Road/Lake Road.** As shown in **Table 4.8-8**, the addition of traffic from the proposed project would cause the operation of the intersection of East Bellevue Road/Lake Road to deteriorate from LOS A in the PM peak hour to LOS F.

- **Intersection #7, Yosemite Avenue/G Street.** As shown in **Table 4.8-8**, the addition of traffic from the proposed project would cause the operation of the intersection of Yosemite Avenue/G Street to deteriorate from LOS D in the PM peak hour to LOS E.

- **Intersection #8, East Yosemite Avenue/Parsons Avenue/North Gardner Avenue.** As shown in **Table 4.8-8**, the intersection of East Yosemite Avenue/Parsons Avenue/North Gardner Avenue would operate at LOS F without the proposed project during the AM and PM peak hours and the addition of project traffic would add more than five seconds to the intersection delay.

- **Intersection #10, East Yosemite Avenue/Lake Road**. As shown in **Table 4.8-8**, the addition of traffic from the proposed project would cause the worst approach to fall from LOS C to LOS F at the intersection of East Yosemite Avenue/Lake Road during the AM and PM peak hours.

- **Intersection #13, West Olive Avenue/M Street**. As shown in **Table 4.8-8**, the intersection of West Olive Avenue/M Street would operate at LOS E without the proposed project during the PM peak hour and the addition of project traffic would add more than five seconds to the intersection delay.

- **Intersection #14, G Street/Olive Avenue**. As shown in **Table 4.8-8**, the intersection of G Street/Olive Avenue would operate at LOS E without the proposed project during the AM peak hour and the addition of project traffic would add more than five seconds to the intersection delay.

- **Intersection #15, West 16th Street/Highway 59**. As shown in **Table 4.8-8**, the intersection of West 16th Street/Highway 59 would operate at LOS F without the proposed project during the PM peak hour and the addition of project traffic would add more than five seconds to the intersection delay.

Physical improvements can be made to all affected intersections to address the impact of 2030 traffic, including the traffic due to the LRDP Project. **Table 4.8-9, Affected Intersections and Recommended Capacity Improvements,** below presents the recommended improvements for each of the affected intersections. Based on a review of aerial photographs of the affected intersections, there are no existing

structures or obstructions in the areas of the recommended improvements. Therefore, these improvements are considered feasible.

Table 4.8-9
Affected Intersections and Recommended Capacity Improvements (2030 Conditions)

Intersection	Delay (seconds)	LOS before Mitigation	Recommended Improvement	Fair Share of Improvement	Delay (seconds)	LOS after Mitigation
Intersection #1, West Bellevue Road/ Highway 59	**83.4** 16.4	**F** C	Add a northbound right turn pocket lane	33%	24.5 12.5	C B
Intersection #2, Bellevue Road/ G Street	**60.8** 26.8	**E** C	Add an eastbound right turn pocket lane	58%	36.1 22.5	D C
Intersection #3, East Bellevue Road/ Lake Road	44.7 **>120**	D **F**	Add northbound and southbound right turn pocket lanes	72%	33.5 15.0	C B
Intersection #7, Yosemite Avenue/ G Street	41.9 **56.6**	D **E**	Remove westbound right turn pocket lane and add westbound left turn pocket lane	29%	40.4 48.3	D D
Intersection #8, East Yosemite Avenue/ Parsons Avenue/ North Gardner Avenue	**>120** **>120**	**F** **F**	Install a signal and widen the westbound approach to provide one left/through lane and one through/right lane	43%	9.2 7.7	A A
Intersection #10, East Yosemite Avenue/ Lake Road	34 **(>120)** **>120(>120)**	D **(F)** **F (F)**	Install a signal, widen the southbound approach to provide separate left turn and right turn lanes, add a second eastbound left turn lane, and widen the northbound departure to provide two acceptance lanes	73%	14.0 11.2	B B
Intersection #13, West Olive Avenue/ M Street	53.9 **68.0**	D **E**	Construct a second southbound left turn lane	12%	49.4 59.5	D E
Intersection #14, G Street/Olive Avenue	**66.7** **71.9**	**E** **E**	Add an overlap phase for the southbound right turn	9%	63.0 68.2	E E
Intersection #15, West 16th Street/ Highway 59	**109.9** **151.1**	**F** **F**	Modify the geometry of the southbound right turn lane to provide a full 200 feet of storage, such that the southbound right turn queues do not interfere with vehicles in the left turn lane	8%	39.2 121.6	E F

Source: Fehr & Peers August 2019.
***Bold** indicates below-standard service level. Shaded indicates a significant impact.*

With respect to small-scale projects that may be located within lands designated CMU, CBRSL or ROS, due to the location, small size, and nature of these projects, they would not cause the campus population to increase and thereby result in increased traffic, and their effect on intersection operations would be less than significant. To the extent a small project would add employees to the campus, those new employees are accounted for in the trip generation analyzed above, and the effect would be mitigated as discussed below.

LRDP Mitigation Measure TRANS-1 is set forth below to mitigate the impact of the LRDP Project on the study area intersections. Because the impacts identified above are the result of cumulative traffic growth along with project traffic, the University will minimize its traffic growth to the extent feasible by further expanding its TDM program (for the existing TDM program, see **Section 4.3.3.5**); monitoring the campus traffic increase; and making a fair-share contribution to the cost of the identified improvements, based on its proportion of traffic growth at each intersection in the year 2030. As noted above, the University is subject to the *UC Merced Revised 2020 Project Transportation Improvement Funding Agreement*, established between the University and the City of Merced in 2016.

Mitigation Measures:

LRDP MM TRANS-1:

Campus Traffic Mitigation Program (CTMP). The Campus Traffic Mitigation Program (CTMP) is a program to monitor trip generation, reduce peak-hour trips, and participate in roadway improvements to mitigate impacts at off-campus intersections, and adjacent roadway segments in the case of Lake Road, determined to be affected by the development of the campus under the 2020 LRDP. CEQA provides that an agency can mitigate its contribution to local and regional environmental impacts by contributing its proportional share of funding to mitigation measures designed to alleviate the identified impact (*State CEQA Guidelines* §15130(a)(3)).

The CTMP will consist of the following elements/measures:

Measure TRANS-1a: Travel Demand Management. To reduce on- and off-campus vehicle trips and resulting impacts, the University will continue to implement and expand a range of Transportation Demand Management (TDM) strategies. TDM strategies will include measures to encourage transit and shuttle use and alternative transportation modes including bicycle transportation, implement parking polices that reduce demand, and implement other mechanisms that reduce vehicle trips to and from the campus. The University shall monitor the performance of campus TDM strategies through annual surveys.

Measure TRANS-1b: Transit Enhancement. To enhance transit systems serving the campus, the University will work cooperatively with the City of Merced, County of Merced, CatTracks, The Bus, Yosemite Area

Regional Transportation System (YARTS), and other local agencies to coordinate service routes with existing and proposed shuttle and transit programs.

Measure TRANS-1c: Sustainability and Monitoring. The University will review individual projects proposed under the 2020 LRDP for consistency with UC Sustainable Practices Policy and UC Merced TDM strategies set forth in the 2020 LRDP to ensure that bicycle and pedestrian improvements, alternative fuel infrastructure, transit stops, and other project features that promote alternative transportation are incorporated in the project.

Measure TRANS-1d: Campus Traffic Impact Monitoring. The University will monitor trip generation resulting from the campus development under the 2020 LRDP to track the actual trip generation relative to the projections in this SEIR. The University will conduct traffic cordon counts of the campus with each 2,000-person increase in student population, measured by three-term average headcount enrollment increases with 2019 – 2020 as the base academic year. If this monitoring determines that traffic attributable to the campus contributes to a significant traffic impact at any of the intersections listed in **Table 4.8-9,** the University will implement measures to reduce vehicle trips contributing to the impact or provide its proportional share of funding for improvements at the impacted intersections presented in **Table 4.8-9**.

Measure TRANS-1e: Proportional Share Determination. At the time a significant impact is identified pursuant to the monitoring under Measure TRANS-1d, the University's actual percent contribution to the total traffic volume at pertinent intersections and roadway segments will be calculated and used as the basis for determining the University's mitigation obligation, or proportional share of funding for the traffic improvements listed in the table.

Measure TRANS-1f: Mitigation Payments. The amount of the University's mitigation funding will be based on the University's proportional share of the affected jurisdiction's actual cost of the relevant traffic improvement(s) at the time of final bid/contract documents. The

amount will be calculated by applying the University's proportional share determined in Measure TRANS-1e to the total cost of the improvement. Funding will be internally committed by the University at the time the traffic impact is triggered pursuant to the results of monitoring under Measure TRANS-1d. Payments will be made to the appropriate jurisdiction at the time a Notice to Proceed with the construction of the improvements is issued. If improvements are constructed before the impact is triggered, the University will pay its proportional share at the time that the impact is triggered, based on the University's monitoring under Measure TRANS-1d. Mitigation payments will be made only after the University has been provided the opportunity to review the scope and budget of the improvement project. As Intersection #3, Lake/Bellevue Road intersection, directly serves the campus, the University will be responsible for the entire cost of improvements at this intersection.

Significance after Mitigation: With the improvements listed in **Table 4.8-9** above, all impacts to affected intersections would be reduced to a less than significant level. However, because the implementation of the improvements depends on funding from other sources and implementation by the responsible agencies (the City of Merced, Merced County, and/or Caltrans), the impacts would remain significant and unavoidable with mitigation.

LRDP Impact TRANS-2: Implementation of the 2020 LRDP would not significantly impact study area freeway segments under 2030 plus project conditions. *(Less than Significant)*

Traffic impacts on study area freeway segments were evaluated under 2030 No Project and 2030 with LRDP Project conditions for the weekday AM and PM peak hours using the methodology described above. Project trips were manually added to the 2030 freeway segment volumes. The results are summarized in **Table 4.8-10, Freeway Operations - 2030 No Project and 2030 with LRDP Project Conditions**.

Table 4.8-10
Freeway Operations - 2030 No Project and 2030 with LRDP Project Conditions

Location	Direction	Peak Hour	2030 No Project Conditions V/C Ratio	2030 with LRDP Project Conditions V/C Ratio
1. SR 99 North of 16th Street	NB	AM	0.59	0.59
		PM	0.68	0.70
	SB	AM	0.54	0.55
		PM	0.72	0.72
2. SR 99 North of SR 140	NB	AM	0.54	0.54
		PM	0.65	0.66
	SB	AM	0.54	0.55
		PM	0.72	0.72
3. SR 99 North of MLK	NB	AM	0.55	0.55
		PM	0.66	0.67
	SB	AM	0.56	0.57
		PM	0.73	0.73
4. SR 99 South of MLK	NB	AM	0.55	0.55
		PM	0.65	0.66
	SB	AM	0.54	0.55
		PM	0.67	0.67
5. SR 99 South of G Street	NB	AM	0.55	0.55
		PM	0.66	0.67
	SB	AM	0.56	0.56
		PM	0.69	0.69
6. SR 99 South of Mission Street	NB	AM	0.53	0.53
		PM	0.64	0.64
	SB	AM	0.40	0.40
		PM	0.56	0.56

Source Fehr & Peers August 2019.

Under 2030 No Project conditions, all freeway segments are projected to operate with a V/C ratio of 0.59 or lower in the AM peak hour, and 0.73 or lower in the PM peak hour. Under 2030 with LRDP Project conditions, the V/C ratio increases on some freeway segments in the AM and PM peak hours with the addition of project traffic. However, all freeway segments are projected to operate with a V/C ratio of 0.59 or lower in the AM peak hour, and 0.73 or lower in the PM peak hour. For these reasons, there would be excess freeway capacity, and drivers under typical conditions would not experience substantial delays. All segments would operate at better than LOS E (V/C = 0.90), so no significant freeway impacts would occur. This impact is considered less than significant.

With respect to small-scale projects that may be located within lands designated CMU, CBRSL or ROS, due to the location, small size, and nature of these projects, they would not cause the campus population to increase and thereby result in increased traffic, and their effect on freeway operations would be less than significant. To the extent a small project would add employees to the campus, those new employees are accounted for in the trip generation analyzed above, and as the analysis shows, the effect on freeway operations would be less than significant.

Mitigation Measures: No mitigation is required.

LRDP Impact TRANS-3: Implementation of the 2020 LRDP would not significantly impact transit facilities. ***(Less than Significant)***

The 2020 LRDP does not propose any changes to transit service or infrastructure provided by non-University operators. UC Merced will continue to make improvements to CatTracks to serve the enrolled students, faculty and staff and will continue to work with transit providers to coordinate service with the campus-provided service. Therefore, the project's impact on transit facilities would be less than significant.

Mitigation Measures: No mitigation is required.

LRDP Impact TRANS-4: Implementation of the 2020 LRDP would not significantly impact pedestrian and bicycle facilities. ***(Less than Significant)***

The 2020 LRDP does not propose any infrastructure changes outside the campus and, thus, would not disrupt existing facilities, interfere with existing or planned pedestrian and bicycle facilities, nor conflict with adopted plans. The 2020 LRDP includes a new entrance into the campus off Lake Road and incorporates another new entrance off Lake Road that was constructed as part of the 2020 Project. The entrance constructed as part of the 2020 Project does not interfere with the off-street multi-use path that runs along the east side of Lake Road. The second new entrance will also be appropriate designed to avoid any impact on the off-street multi-use path. The project's impact on pedestrian and bicycle facilities would be less than significant.

Mitigation Measures: No mitigation is required.

LRDP Impact TRANS-5: The campus road network system would be adequately sized and designed to facilitate emergency access vehicles. ***(Less than Significant)***

The transportation facilities, including connections to the off-campus facilities, anticipated under the 2020 LRDP will be constructed according to State of California design standards for roadway and intersection design and operations. In addition, no infrastructure changes outside the campus are proposed under the

2020 LRDP. For these reasons, implementation of the 2020 LRDP would not substantially increase hazards due to a design feature or incompatible uses nor would it result in inadequate emergency access. This impact is considered less than significant.

Mitigation Measures: No mitigation is required.

4.8.6 Cumulative Impacts and Mitigation Measures

Cumulative Impact C-TRANS-1: **Implementation of the 2020 LRDP would significantly impact study area intersections during peak commute hours under 2035 plus project conditions.** ***(Significant; Significant and Unavoidable)***

The year of analysis for the cumulative impact analysis is 2035, which provides a longer-term scenario in which to identify transportation impacts and mitigation measures. Although 2030 is used in this SEIR as the horizon year for the analysis of the campus development impacts of the 2020 LRDP, it is anticipated that the campus will continue to grow beyond 2030, although the rate and manner of that growth is not known at this time. For purposes of the cumulative impact analysis in this SEIR, it is assumed that enrollment and campus development will continue to increase at approximately the same annual rate as is currently projected between 2020 and 2030. Based on this assumption, the campus is expected to add an additional 2,500 students between 2030 and 2035, and enrollment is projected to increase to about 17,500 students. Faculty and staff are projected to increase to 2,975 employees by 2035. Campus development through 2035 is referred to as the "2035 Campus Scenario" in the analysis below.

Traffic Growth from Approved and Anticipated Development

As noted earlier in this section, the County and City of Merced provided a list of approved projects expected to be constructed by 2035. The vehicle trip generation for the approved and anticipated development through 2035 was estimated using average trip generation rates and trip generation equations for the proposed land uses from ITE's Trip Generation (9th Edition), and, where available, the traffic impact assessments prepared for specific developments. The total trip generation of the approved and anticipated development is estimated at 3,860 AM peak hour trips and 7,053 PM peak hour trips in 2035. **Appendix 4.8** contains the detailed trip generation calculations.

Traffic generated by the approved and anticipated development was assigned to the roadway network based on trip distribution information derived from the MCAG Travel Demand Model. Specifically,

several 'select zone' runs were used to determine the general distribution of traffic from residential and commercial traffic analysis zones; these distribution patterns were then manually applied to the approved/anticipated development traffic, using the manual traffic assignment software Vistro. The appendix contains detailed information on the trip assignment process.

The estimated peak hour intersection turning movements resulting from approved and anticipated development in 2035 are shown in **Figure 4.8-10, 2035 Approved/Anticipated Development Trip Assignment**.

As explained earlier, the trip generation and assignment process in this analysis is conservative in that it does not discount for the fact that some of the new trips generated by the new housing development in the City will be made by the new faculty, staff and students who would occupy some of the new housing and would make daily vehicle trips to the campus.

2035 Roadway Network

In addition to the signalization of East Bellevue Road/Lake Road which was completed in 2018, the 2035 roadway network includes the completion of Campus Parkway from its current terminus north to Yosemite Avenue. The construction of the roadway segment has begun. As noted earlier, relatively few campus trips (less than 50 per direction per peak hour) are expected to use Campus Parkway; therefore, intersections along Campus Parkway were not selected for analysis.

2035 No Project and With Project Traffic Volumes

Figure 4.8-11, 2035 No Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls, shows the intersection volumes which result from adding the 2035 approved/anticipated development volumes to the existing volumes. **Figure 4.8-12, 2035 With 2035 Campus Scenario Intersection Traffic Volumes, Lane Configurations and Traffic Controls**, shows the 2035 With 2035 Campus Scenario traffic volumes, which result from adding the 2020 Project volumes, LRDP Project volumes, and volumes associated with campus growth between 2030 and 2035.

2035 Intersection Levels of Service

Peak hour intersection operations for the 2035 with 2035 Campus Scenario are shown **Table 4.8-11, Intersection Levels of Service – 2035 No Project and 2035 with 2035 Campus Scenario.** The following intersections are projected to operate deficiently in at least one peak hour:

Intersection #1: West Bellevue Road/Highway 59
Intersection #2: Bellevue Road/G Street
Intersection #3: East Bellevue Road/Lake Road
Intersection #4: G Street/Cardella Road
Intersection #7: Yosemite Avenue/G Street
Intersection #8: East Yosemite Avenue/Parsons Avenue/North Gardner Avenue
Intersection #10: East Yosemite Avenue/Lake Road
Intersection #11: West Olive Avenue/Highway 59
Intersection #13: West Olive Avenue/M Street
Intersection #14: Olive/G Street
Intersection #15: West 16th Street/Highway 59
Intersection #16: SR 99 Northbound Ramps/MLK Jr. Way
Intersection #17: SR 99 Northbound Off-Ramp/West 14th Street/G Street
Intersection #18: Lake Road/Project Driveway #1
Intersection #19: Lake Road/Project Driveway #2

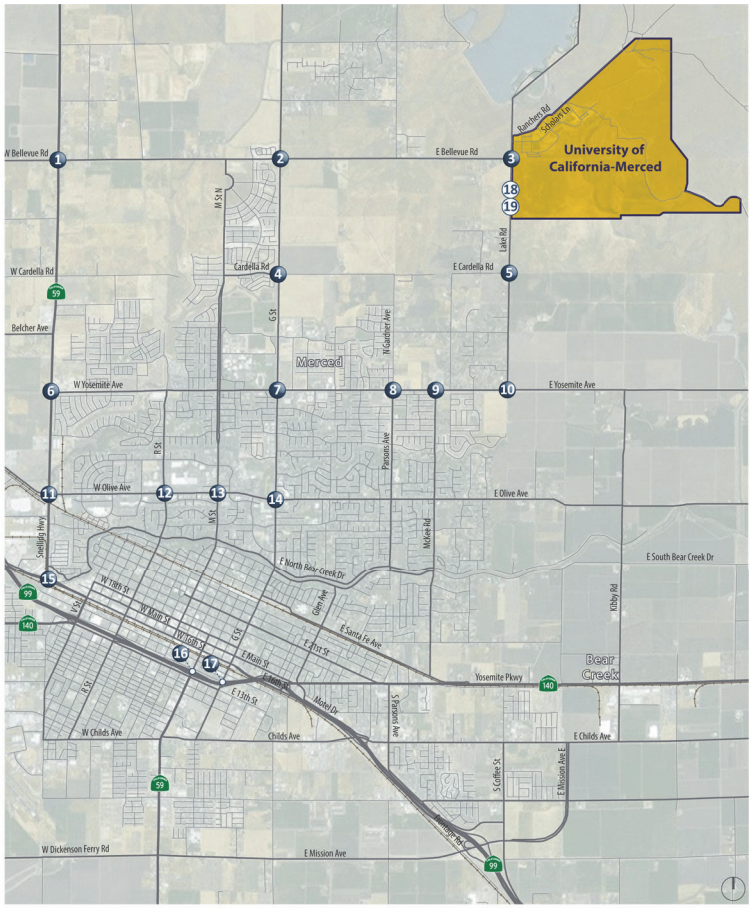
At intersections #8, #15, and #16, the peak hour signal warrants are met under 2035 No Project conditions in one or both peak hours and would continue to be met under 2035 With 2035 Campus Scenario conditions. At intersections #10, #17, #18, and #19, the addition of project traffic would cause the peak hour signal warrant to be met.

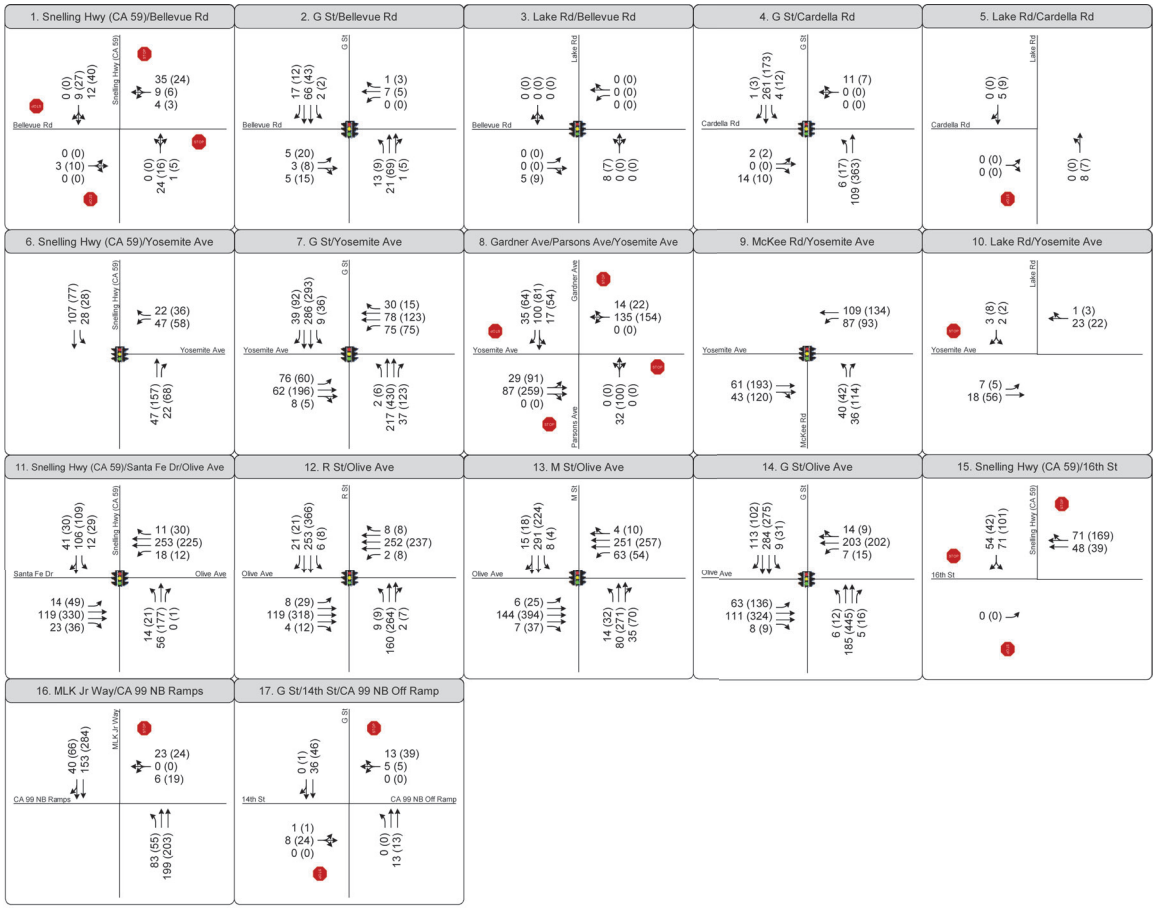
Based on the significance thresholds presented above in **Section 4.8.4**, the following 15 intersections would operate poorly, and the 2035 Campus Scenario would make a cumulatively considerable contribution to the cumulative impact at these locations:

- **Intersection #1, West Bellevue Road/Highway 59.** As shown in **Table 4.8-11**, the intersection of West Bellevue Road and Highway 59 would operate at LOS F without the 2035 Campus Scenario during the AM peak hour and the addition of project traffic would add more than five seconds to the intersection delay.

- **Intersection #2, Bellevue Road/G Street.** As shown in **Table 4.8-11**, the addition of traffic from the 2035 Campus Scenario would cause the operation of the intersection of Bellevue Road/G Street to deteriorate from LOS D in the AM peak hour to LOS E.

- **Intersection #3, East Bellevue Road/Lake Road.** As shown in **Table 4.8-11**, the addition of traffic from the 2035 Campus Scenario would cause the operation of the intersection of East Bellevue Road/Lake Road to deteriorate from LOS B and A in the AM and PM peak hours, respectively, to LOS E and F, respectively.





Source: City of Merced and Merced County.

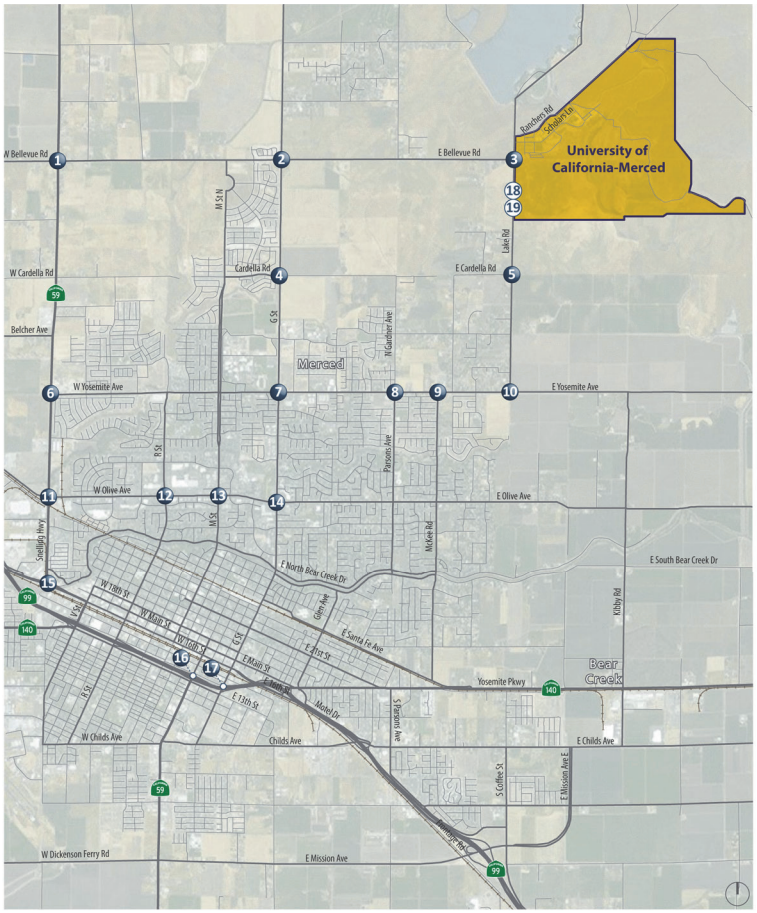
XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

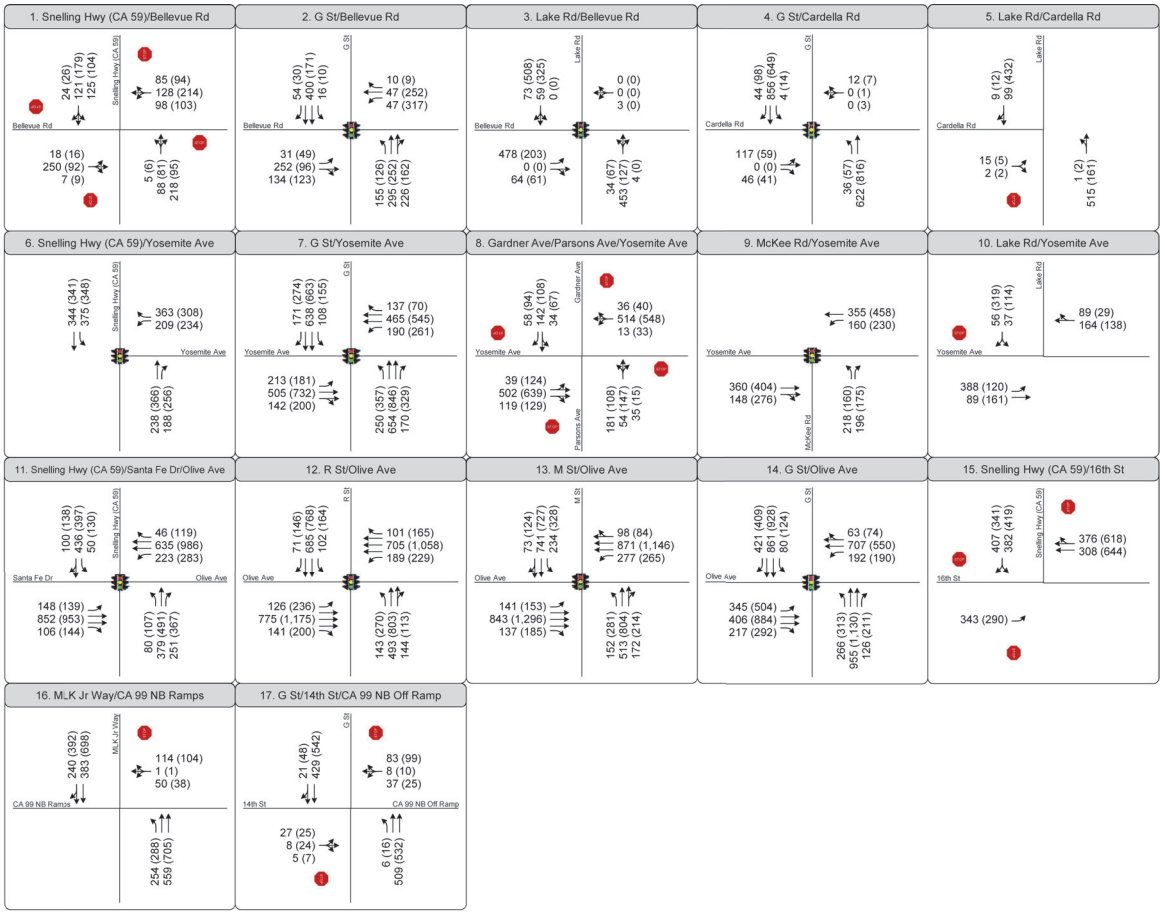
Project Site # Study Intersection

SOURCE: Fehr & Peers, 2019

FIGURE **4.8-10**

2035 Approved/Anticipated Development Trip Assignment





Note: This figure includes traffic volumes associated with approved and anticipated projects through the year 2035.

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

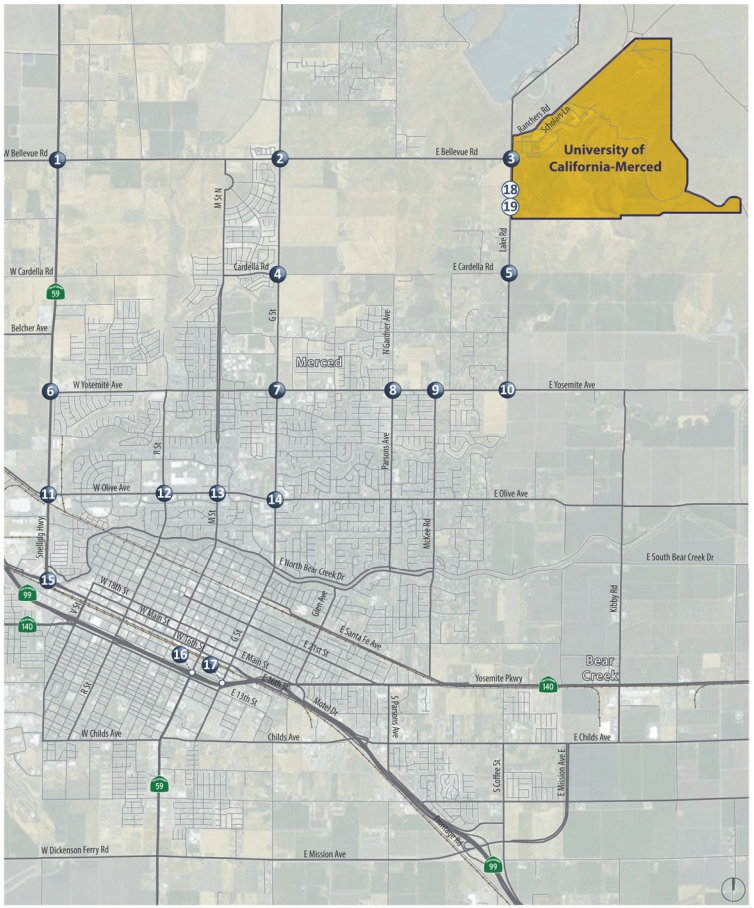
Project Site

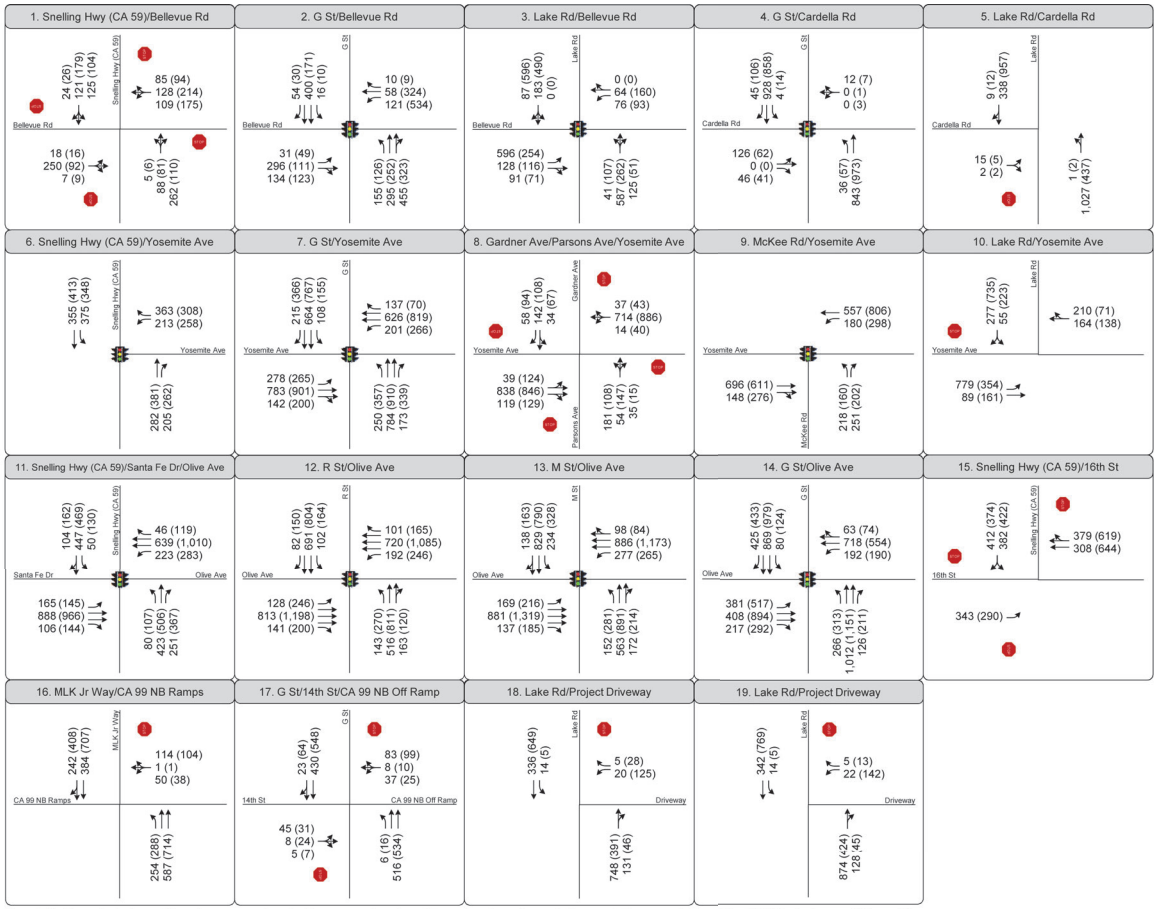
Study Intersection

SOURCE: Fehr & Peers, 2019

FIGURE **4.8-11**

2035 No Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls





Note: This figure includes traffic volumes associated with approved and anticipated projects through the year 2035, completion of the 2020 Project, completion of the LRDP Project (additional campus growth to 15,000 students), and additional growth to 17,500 students.

XX (YY) AM (PM) Peak Hour Traffic Volumes | Signalized Intersection | Stop Sign

Project Site | Study Intersection | With Project Study Intersection

SOURCE: Fehr & Peers, 2019

FIGURE **4.8-12**

2035 With 2035 Campus Scenario Intersection Traffic Volumes, Lane Configurations and Traffic Controls

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Table 4.8-11
Intersection Levels of Service - 2035 No Project and 2035 with 2035 Campus Scenario

Intersection	Traffic Control	Peak Hour[1,2]	2035 No Project Conditions[3]		2035 with 2035 Campus Scenario Conditions[3]	
			Delay (Seconds)	LOS	Delay (Seconds)	LOS
1. West Bellevue Road/Highway 59	AWS	AM	83.5	F	**103.0**	**F**
		PM	15.2	C	20.2	C
2. Bellevue Road/G Street	Signal	AM	42.7	D	**75.6**	**E**
		PM	22.4	C	30.6	C
3. East Bellevue Road/Lake Road	Signal	AM	10.9	B	**58.0**	**E**
		PM	9.4	A	**>120**	**F**
4. Cardella Road/G Street	Signal	AM	33.0	C	**57.8**	**E**
		PM	8.0	A	9.8	A
5. East Cardella Road/Lake Road	SSS	AM	0.4 (13.6)	A (B)	0.4 (34.5)	A (D)
		PM	0.2 (12.6)	A (B)	0.1 (28.1)	A (D)
6. West Yosemite Avenue/ Highway 59	Signal	AM	17.7	B	19.4	B
		PM	15.3	B	16.3	B
7. Yosemite Avenue/G Street	Signal	AM	41.2	D	53.8	D
		PM	57.1	E	**76.4**	**E**
8. East Yosemite Avenue/Parsons Avenue/North Gardner Avenue	AWS	AM	101.9	F	**>120**	**F**
		PM	118.9	F	**>120**	**F**
9. East Yosemite Avenue/McKee Road	Signal	AM	11.1	B	13.3	B
		PM	12.2	B	15.2	B
10. East Yosemite Avenue/Lake Road	SSS	AM	6.3 (17.5)	A (C)	**>120 (>120)**	**F (F)**
		PM	10.5 (19.1)	B (C)	**>120 (>120)**	**F (F)**
11. West Olive Avenue/Highway 59	Signal	AM	48.7	D	54.5	D
		PM	50.7	D	**56.4**	**E**
12. West Olive Avenue/R Street	Signal	AM	48.1	D	48.6	D
		PM	63.5	E	**64.9**	**E**
13. West Olive Avenue/M Street	Signal	AM	53.5	D	**59.3**	**E**
		PM	69.8	E	**79.7**	**E**
14. Olive Avenue/G Street	Signal	AM	75.9	E	**86.4**	**F**
		PM	90.9	F	**102.3**	**F**
15. West 16th Street/Highway 59[4]	AWS	AM	>120	F	**>120**	F
		PM	>120	F	**>120**	**F**
16. SR 99 Northbound Ramps/MLK Jr. Way	SSS	AM	7.3 (55.8)	A (F)	7.6 **(60.2)**	A (F)
		PM	15.3 (>120)	C (F)	16.8 **(>120)**	C **(F)**
17. SR 99 Northbound Off-Ramp/West 14th Street/G Street	SSS	AM	2.9 (22.8)	A (C)	3.3 (25.6)	A (D)
		PM	3.5 (34.5)	A (D)	3.8 (38.0)	A **(E)**
18. Lake Road/Project Driveway #1	SSS	AM	-	-	0.6 (25.4)	A (D)
		PM			5.1 **(40.9)**	A **(E)**
19. Lake Road/Project Driveway #2	SSS	AM	-	-	0.7 (31.3)	A (D)
		PM			10.6 **(94.8)**	B **(F)**

Source: Fehr & Peers August 2019.

[1] *Signal = signalized intersection; AWS=all-way stop; SSS=side street stop.*

[2] *For side-street stop-controlled intersections, two service levels are listed: Average intersection LOS (LOS for worst side-street movement).*

[3] ***Bold** indicates below-standard service level. Shaded indicates a significant impact.*

[4] *AM impact is not significant because the delay change with the project is less than 5 seconds.*

- **Intersection #4, G Street/Cardella Road.** As shown in **Table 4.8-11**, the addition of traffic from the 2035 Campus Scenario would cause the operation of the intersection of G Street/Cardella Road to deteriorate from LOS C in the AM peak hour to LOS E.

- **Intersection #7, Yosemite Avenue/G Street.** As shown in **Table 4.8-11**, the addition of traffic from the 2035 Campus Scenario would cause the operation of the intersection of Yosemite Avenue/G Street to deteriorate from LOS D in the PM peak hour to LOS E.

- **Intersection #8, East Yosemite Avenue/Parsons Avenue/North Gardner Avenue.** As shown in **Table 4.8-11**, the intersection of East Yosemite Avenue/Parsons Avenue/North Gardner Avenue would operate at LOS F without the 2035 Campus Scenario during the AM and PM peak hours and the addition of project traffic would add more than five seconds to the intersection delay.

- **Intersection #10, East Yosemite Avenue/Lake Road**. As shown in **Table 4.8-11**, the addition of traffic from the 2035 Campus Scenario would cause the worst approach to deteriorate from LOS C to LOS F at the intersection of East Yosemite Avenue/Lake Road during the AM and PM peak hours.

- **Intersection #11, West Olive Avenue/Highway 59.** As shown in **Table 4.8-11**, the addition of traffic from the 2035 Campus Scenario would cause the operation of the intersection of West Olive Avenue/Highway 59 to deteriorate from LOS D in the PM peak hour to LOS E.

- **Intersection #13, West Olive Avenue/M Street**. As shown in **Table 4.8-11**, the addition of traffic from the 2035 Campus Scenario would cause the operation of the intersection of West Olive Avenue/M Street to deteriorate from LOS D in the AM peak hour to LOS E. In addition, the intersection of West Olive Avenue/M Street would operate at LOS E without the 2035 Campus Scenario during the PM peak hour and the addition of project traffic would add more than five seconds to the intersection delay.

- **Intersection #14, G Street/Olive Avenue**. As shown in **Table 4.8-11**, the intersection of G Street/Olive Avenue would operate at LOS E and F without the 2035 Campus Scenario during the AM and PM peak hours, respectively, and the addition of project traffic would add more than five seconds to the intersection delay.

- **Intersection #15, West 16th Street/Highway 59**. As shown in **Table 4.8-11**, the intersection of West 16th Street/Highway 59 would operate at LOS F without the 2035 Campus Scenario during the PM peak hour and the addition of project traffic would add more than five seconds to the intersection delay.

- **Intersection #16, Martin Luther King, Jr. Way/SR 99 Northbound Ramps**. As shown in **Table 4.8-11**, the worst approach to the intersection of Martin Luther King, Jr. Way/SR 99 Northbound Ramps would operate at LOS F without the 2035 Campus Scenario during the PM peak hour and the addition of project traffic would add more than five seconds to the intersection delay.

- **Intersection #17, G Street/14th Street/SR 99 Northbound Off-Ramp.** As shown in **Table 4.8-11**, the addition of traffic from the 2035 Campus Scenario would cause the operation of the intersection of G Street/14th Street/SR 99 Northbound Off-Ramp to deteriorate from LOS D in the PM peak hour to LOS E.

- **Intersection #18, Lake Road/Project Driveway #1.** As shown in **Table 4.8-11**, the addition of traffic from the 2035 Campus Scenario would cause the worst approach to operate at LOS E in the PM peak hour.

- **Intersection #19, Lake Road/Project Driveway #2.** As shown in **Table 4.8-11**, the addition of traffic from the 2035 Campus Scenario would cause the worst approach to operate at LOS F in the PM peak hour.

Capacity improvements set forth in **Table 4.8-12, Affected Intersections and Recommended Capacity Improvements (2035 Conditions)**, would improve traffic operations at the study intersections listed above. Based on a review of aerial photographs of the affected intersections, there are no existing structures or obstructions in the areas of the recommended improvements. Therefore, these improvements are considered feasible.

Table 4.8-12
Affected Intersections and Recommended Capacity Improvements (2035 Conditions)

Intersection	Delay (Seconds)	LOS before Mitigation	Recommended Improvement	Fair Share of Improvement	Delay (Seconds)	LOS after Mitigation
Intersection #1, West Bellevue Road/ Highway 59	**103.0** 20.2	**F** C	Add a northbound right turn pocket lane	38%	27.3 13.1	D B
Intersection #2, Bellevue Road/ G Street	**75.6** 30.6	**E** C	Add an eastbound right turn pocket lane	62%	43.1 26.6	D C
Intersection #3, East Bellevue Road/ Lake Road	**70.4** **>120**	**E** **F**	a) Add northbound and southbound right turn pocket lanes b) If determined to be necessary based on annual monitoring of traffic congestion, and in conjunction with the improvements identified at intersections #3(a), #18 and #19, widen Lake Road to provide four through lanes between East Bellevue Road and the southern campus boundary, to facilitate traffic flow between the intersections providing campus access on Lake Road	79%	38.4 19.9	D B
Intersection #4, G Street/Cardella Road	**57.8** 9.8	**E** A	Optimize signal timing	36%	34.4 9.1	C A
Intersection #7, Yosemite Avenue/ G Street	53.8 **76.4**	D **E**	Remove westbound right turn pocket lane and add westbound left turn pocket lane, and add an eastbound left turn pocket lane	31%	42.5 57.3	D E
Intersection #8, East Yosemite Avenue/ Parsons Avenue/ North Gardner Avenue	**>120** **>120**	**F** **F**	Install a signal and widen the westbound approach to provide one left/through lane and one through/right lane	46%	10.6 10.3	B B

Table 4.8-12
Affected Intersections and Recommended Capacity Improvements (2035 Conditions)

Intersection	Delay (Seconds)	LOS before Mitigation	Recommended Improvement	Fair Share of Improvement	Delay (Seconds)	LOS after Mitigation
Intersection #10, East Yosemite Avenue/ Lake Road	**>120 (>120)** **>120 (>120)**	**F (F)** **F (F)**	Install a signal, widen the southbound approach to provide separate left turn and right turn lanes, add a second eastbound left turn lane, and widen the northbound departure to provide two acceptance lanes	78%	15.5 13.0	B B
Intersection #11, West Olive Avenue/ Highway 59	54.5 **56.4**	D **E**	Add a southbound right turn pocket lane.	13%	48.0 48.7	D D
Intersection #13, West Olive Avenue/M Street	59.3 **79.7**	**E** **E**	Construct a second southbound left turn lane	17%	53.9 66.7	D E
Intersection #14, G Street/Olive Avenue	**86.4** **102.3**	**F** **F**	Add an overlap phase for the southbound right turn	9%	79.8 95.2	E F
Intersection #15, West 16th Street/ Highway 59	**>120** **>183.7**	**F** **F**	Modify the geometry of the southbound right turn lane to provide a full 200 feet of storage, such that the southbound right turn queues do not interfere with vehicles in the left turn lane	10%	47.0 147.8	E F
Intersection #16, Martin Luther King, Jr. Way/SR 99 Northbound Ramps	7.6 **(60.2)** 16.8 **(>120)**	A **(F)** C **(F)**	Install a signal	4%	12.6 14.7	B B
Intersection #17, G Street/14th Street/ SR 99 Northbound Off-Ramp	3.3 (25.6) 3.8 **(38.0)**	A (D) A **(E)**	Install a signal	16%	9.1 8.8	A A
Intersection #18, Lake Road/Project Driveway #1	0.6 (25.4) 5.1 **(40.9)**	A (D) A **(E)**	Install a signal; See also Intersection #3 improvement measure (b)	76%	3.7 5.8	A A
Intersection #19, Lake Road/Project Driveway #2	0.7 (31.3) 10.6 **(94.8)**	A (D) B **(F)**	Install a signal; See also Intersection #3 improvement measure (b)	87%	6.5 7.4	A A

Source: Fehr & Peers August 2019.
***Bold** indicates below-standard service level. Shaded indicates a significant impact.*

LRDP Mitigation Measure C-TRANS-1 is set forth below to mitigate the cumulative impact of campus traffic growth on the study area intersections under 2035 conditions. Because the impacts identified above are the result of cumulative traffic growth along with campus traffic, the University will minimize its traffic growth to the extent feasible by further expanding its TDM program; monitoring the traffic increase; and making a fair share contribution to the cost of the identified improvements based on its proportion of traffic growth at each intersection in the year 2035.

Mitigation Measures:

Cumulative MM C-TRANS-1: The University will implement **LRDP Mitigation Measure TRANS-1** to reduce vehicle trips, monitor traffic growth, and make fair share contributions to address the project's contribution to cumulative impacts under 2035 conditions.

Certain improvements in **Table 4.8-12** are the same as, or similar to, improvements identified in **Table 4.8-9** for the 2030 with LRDP Project scenario; therefore, as and when fair share is calculated for these intersection improvements, the calculation shall take into account the redundant improvements.

As Intersections #3, #18 and #19 would directly serve the campus, the University will be responsible for the entire cost of improvements at these three intersections.

Significance after Mitigation: With the improvements described in **Table 4.8-12** above, all impacts to affected intersections would be reduced to a less than significant level. However, because the implementation of the improvements depends on the responsible agencies (the City of Merced, Merced County, and/or Caltrans), the impacts would remain significant and unavoidable with mitigation.

Cumulative Impact C-TRANS-2: **Implementation of the 2020 LRDP would not significantly affect study area freeway segments under 2035 plus project conditions.** ***(Less than Significant)***

Traffic impacts on study area freeway segments were evaluated under 2035 No Project and with 2035 Campus Scenario conditions for the weekday AM and PM peak hours using the methodology described above. Project trips were manually added to the freeway segment volumes. The results are summarized in **Table 4.8-13, Freeway Operations – 2035 No Project and 2035 with 2035 Campus Scenario**.

Table 4.8-13
Freeway Operations – 2035 No Project and 2035 with 2035 Campus Scenario

Location	Direction	Peak Hour	2035 No Project Conditions V/C Ratio	2035 with 2035 Campus Scenario Conditions V/C Ratio
1. SR 99 North of 16th Street	NB	AM	0.62	0.62
		PM	0.71	0.74
	SB	AM	0.56	0.57
		PM	0.76	0.76
2. SR 99 North of SR 140	NB	AM	0.56	0.56
		PM	0.67	0.69
	SB	AM	0.56	0.57
		PM	0.76	0.76
3. SR 99 North of MLK	NB	AM	0.57	0.58
		PM	0.68	0.70
	SB	AM	0.58	0.60
		PM	0.77	0.78
4. SR 99 South of MLK	NB	AM	0.56	0.56
		PM	0.67	0.68
	SB	AM	0.56	0.56
		PM	0.69	0.70
5. SR 99 South of G Street	NB	AM	0.57	0.57
		PM	0.68	0.69
	SB	AM	0.57	0.58
		PM	0.72	0.72
6. SR 99 South of Mission Street	NB	AM	0.54	0.54
		PM	0.66	0.66
	SB	AM	0.41	0.40
		PM	0.57	0.57

Source: Fehr & Peers August 2019.

Under 2035 No Project conditions, all freeway segments would operate with a V/C ratio of 0.62 or less in the AM peak hour, and 0.77 or less in the PM peak hour. Under 2035 with 2035 Campus Scenario conditions, the V/C ratio increases on some freeway segments in the AM and PM peak hours with the addition of project traffic. However, all freeway segments would operate with a V/C ratio of 0.62 or less in the AM peak hour, and 0.78 or less in the PM peak hour. For these reasons, there would be excess freeway capacity, and drivers would not experience substantial delays under typical conditions. All segments would operate at better than LOS E (V/C = 0.90), so no significant freeway impacts are identified. This impact is considered less than significant.

Mitigation Measures: No mitigation is required.

4.8.7 References

Fehr and Peers. 2019. *UC Merced 2020 LRDP Transportation Impact Analysis*. August.

Merced County Council of Governments. 2018. *2018 Regional Transportation Plan/Sustainable Communities Strategy for Merced County.*

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