IV. ENVIRONMENTAL IMPACT ANALYSIS
O. TRANSPORTATION AND TRAFFIC

INTRODUCTION

This chapter analyzes the potential transportation impacts of the proposed project under Existing and Cumulative conditions. Where significant impacts are identified, mitigation measures are recommended to lessen their significance.

Project Description

For purposes of this EIR, the project is analyzed based on the following trip generating land uses:

- 469 single family residential homes
- 233 multi-family residential dwelling units
- 240,000 square feet of commercial
- 205,000 square feet of medical/dental office
- 3.3 acres of park
- 108 acres of open space

The project also includes the following roadway network modifications:

- Extension of Laredo Way from Niagara Way to Bruce Road
- Extension of Webster Drive to Bruce Road
- Bruce Road widening from two to four travel lanes with adequate turning lanes and Class II bike lanes (Webster Drive to E 20th Street)
- Two-lane roundabout at E 20th Street / Bruce Road intersection
- Traffic signal at Bruce Road / Webster Drive intersection with adequate turning lanes

ENVIRONMENTAL SETTING

This section describes the existing environmental setting, which is the baseline scenario which project-specific impacts are evaluated. The existing transportation system within the study area includes roadways, bicycle facilities, pedestrian facilities, and public transit service and facilities.

Project Study Area

The study area was developed based on collaboration between the City of Chico staff and the EIR consultant. The following factors were considered when developing the study area: the project's expected travel characteristics (trip generation and distribution), primary travel routes to and from the project, and travel mode split. Figure IV.O-1 shows the study area, project site, and 19 study intersections selected for analysis.

Table IV.O-1 lists the study intersections. All study intersections are operated and maintained by the City of Chico, except for intersections 1, 2, 3, 14, and 15 which are operated and maintained by Caltrans, and intersection 19 which does not exist today. The study area also includes bicycle, pedestrian, and transit facilities in the project vicinity.

Roadway Network

A network of local roadways and freeway facilities form the roadway system within the study area. The following key roadways within this system would serve trips associated with the proposed project. Posted speed limits and number of travel lanes for these key roadways and freeways are shown in Figure IV.O-2.

Table IV.O-1
Study Intersections

Intersection	Jurisdiction
1. State Route 32 / Bruce Road	Caltrans
2. E 20th Street / State Route 99 Southbound Ramps	Caltrans
3. E 20th Street / State Route 99 Northbound Ramps	Caltrans
4. E 20th Street / Chico Mall	City of Chico
5. E 20th Street / Forest Avenue	City of Chico
6. E 20th Street / Huntington Drive	City of Chico
7. E 20th Street / Notre Dame Boulevard	City of Chico
8. E 20th Street / Bruce Road	City of Chico
9. Notre Dame Boulevard / Parkhurst St	City of Chico
10. Notre Dame Boulevard / Jasper Drive	City of Chico
11. Notre Dame Boulevard / Webster Drive	City of Chico
12. Notre Dame Boulevard / Forest Avenue	City of Chico
13. Bruce Road / Raley Boulevard	City of Chico
14. Skyway Road / State Route 99 Southbound Ramps	Caltrans
15. Skyway Road / State Route 99 Northbound Ramps	Caltrans
16. Skyway Road / Notre Dame Boulevard	City of Chico
17. Skyway Road / Forest Avenue	City of Chico
18. Skyway Road / Bruce Road	City of Chico
19. Bruce Road / Webster Drive[1]	City of Chico

Notes:

[1]Intersection 19 is not an existing intersection; only analyzed under Existing Plus Project and Cumulative Plus Project.

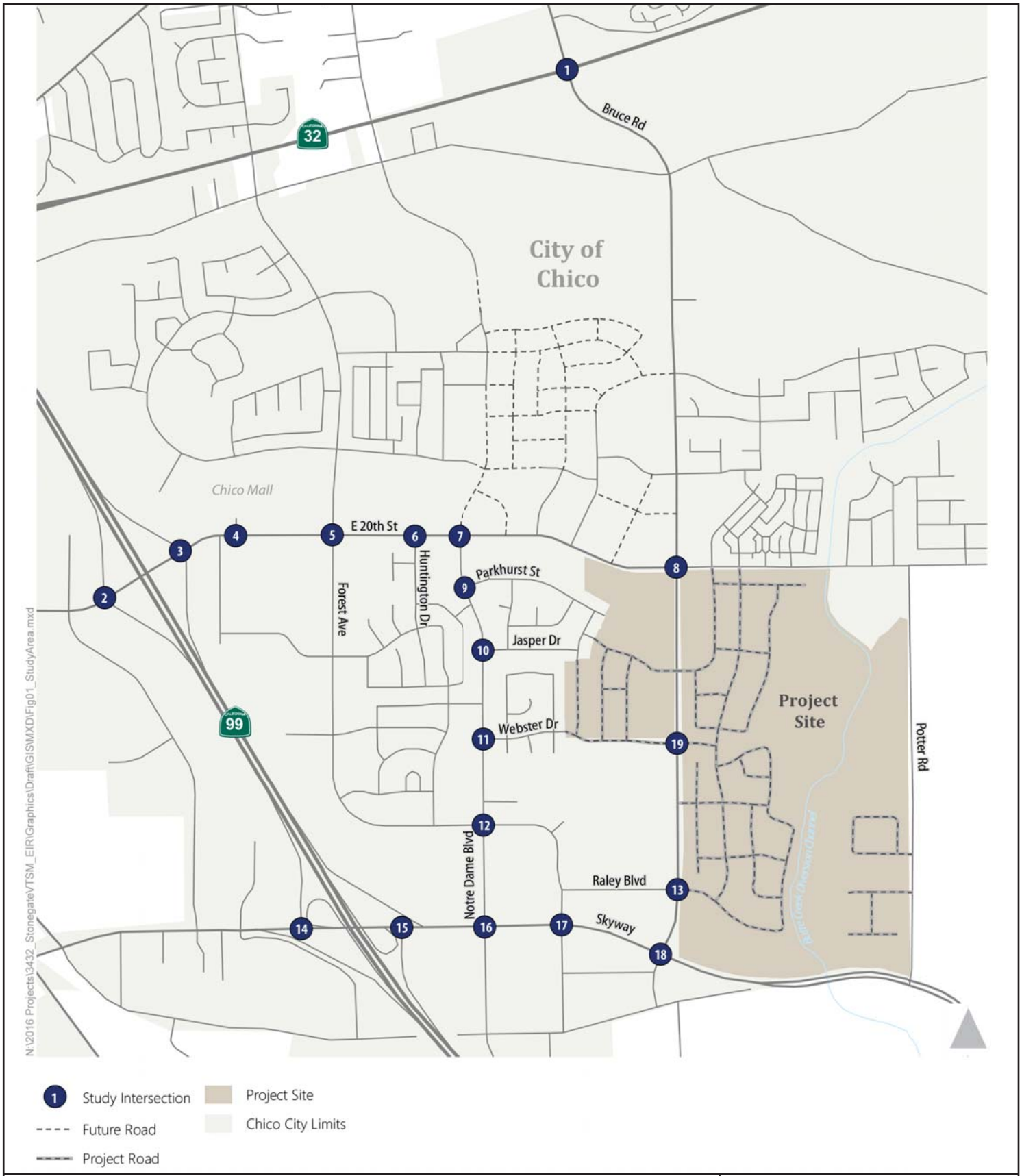

Figure IV.O-1 Study Area

Stonegate Vesting Tenative Subdivision
Map and GPA/Rezone
City of Chico, California

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Date: 3/28/18
Source: Fehr & Peers

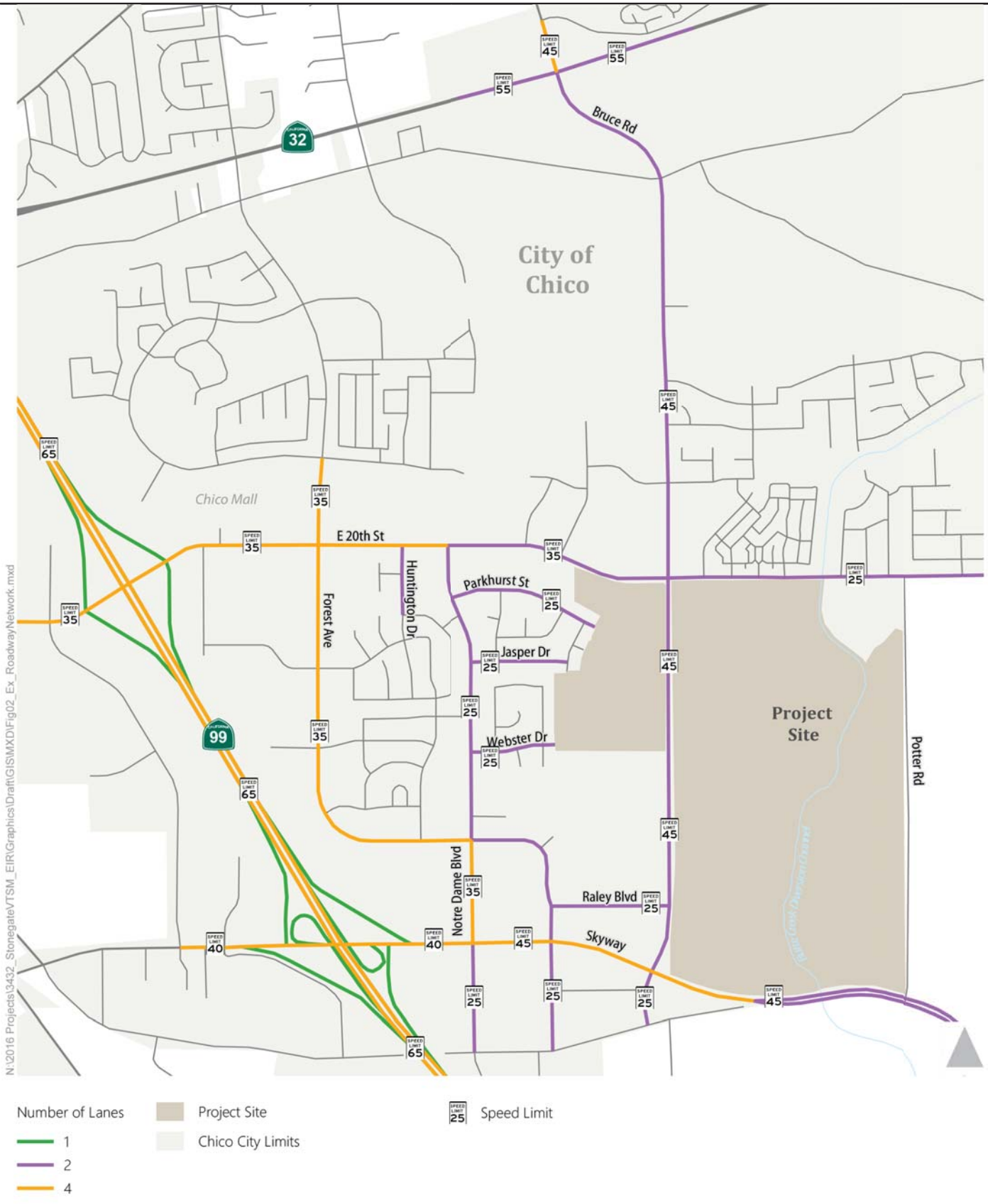

Figure IV.O-2 Existing Roadway Network

Stonegate Vesting Tenative Subdivision
Map and GPA/Rezone
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Date: 3/28/18
Source: Fehr & Peers

Bruce Road is a north-south arterial connecting residential areas north of State Route (SR) 32 and near E 20th Street to the industrial and retail land use along Skyway. Bruce Road is currently a two-lane facility with a posted speed limit of 45 miles per hour (mph) in the project site area between E 20th Street and Skyway. It becomes three lanes wide (two northbound lanes) between E 20th Street and Picholine Way, and it is four lanes wide through some of the residential areas north of SR 32.

East 20th Street (E 20th Street) is a major east-west arterial that begins to the west at Park Avenue, and continues east through SR 99 interchange to Bruce Road, where the roadway continues as collector through residential development. With the exception of the easternmost ½ mile of roadway near Bruce Road, E 20th Street is a divided four lane roadway with channelized left turn pockets at major streets, a posted Class II bike lane, and a posted speed limit of 35 mph.

Skyway is a generally east-west arterial that provides access to SR 99 on the south end of Chico. On the east side of SR 99, Skyway connects Chico to smaller communities such as Paradise and Stirling City. Within the study area, Skyway is a four lane-facility with posted speed limits in the range of 35 to 45 mph. Skyway becomes E. Park Avenue west of SR 99.

Forest Avenue is a primarily north-south arterial connecting residential neighborhoods north of E 20th Street and SR 32 to commercial areas such as Chico Mall and Skypark Plaza. At its northern terminus, Forest Avenue starts at E 8th Street as a two-lane road that widens to four lanes south of SR 32. Between Humboldt Avenue and Notre Dame Boulevard, Forest Avenue is a four-lane facility with raised medians and a typical posted speed limit of 35 mph. After Notre Dame Boulevard, it becomes a two-lane collector, transitioning to Zanella Way south of Skyway.

Notre Dame Boulevard is a north-south arterial through residential neighborhoods. It begins south of Skyway and currently terminates at E 20th Street, with intermittent sections between E 20th Street and Humboldt Road to the north, where it transitions to El Monte Avenue. The roadway is primarily two lanes with a posted speed limit of 25 mph, except for a section between Forest Avenue and Skyway where it is four lanes and 35 mph.

Parkhurst Street is an east-west local road with fronting residential that connects to Notre Dame Boulevard. The street currently terminates to the east at Niagara Way at the boundary of the proposed project.

Jasper Drive is an east-west local road with fronting residential that connects to Notre Dame Boulevard at its western terminus. The street terminates to the east at Niagara Way.

Webster Drive is an east-west local road with fronting residential that connects to Notre Dame Boulevard. The street currently terminates at New Dawn Circle to the east at the boundary of the proposed project.

Raley Boulevard is currently a short east-west street segment between Forest Avenue and Bruce Road just north of Skyway. Raley Boulevard is two lanes wide and provides access to the Skyway Professional Center.

State Route 32 (SR 32) is a California state highway connecting the City of Chico to Orland to the west and into the Sierra Nevada to the east. In the study area, SR 32 is a two-lane arterial with a posted speed limit of 55 mph.

State Route 99 (SR 99) is a California state highway connecting the City of Chico to other cities in the region such as Red Bluff, Yuba City, and Sacramento. SR 99 also connects to the Interstate-5 freeway near Red Bluff and North Natomas. Within the study area, SR 99 is a four lane freeway facility that connects to the City of Chico roadway network via interchanges at Skyway and at E 20th Street.

Traffic Data Collection

Traffic counts were collected at the study intersections and freeway mainline in October 2015 and May 2016 during the weekday AM (7-9) and PM (4-6) peak periods. During all counts, weather conditions were generally dry, no unusual traffic patterns were observed, and the Chico Unified School District was in full session.

Study Periods

Based on the traffic data collections, the AM peak hour within the study area intersections occurred from 7:30 to 8:30, and the PM peak hour occurred from 4:30 to 5:30. For the freeway mainline, the AM peak hour occurred from 7:15 to 8:15, and the PM peak hour occurred from 4:30 to 5:30.

Roadway System

Traffic operations at all study intersections were analyzed under weekday AM and PM peak hour conditions using the procedures and methodologies contained in the *Highway Capacity Manual* (Transportation Research Board, 2010) for calculating delay at intersections. These methodologies were applied using Synchro traffic operations analysis software.

Intersection Level of Service Definitions

Each study intersection was analyzed using the concept of Level of Service (LOS). LOS is a qualitative measure of traffic operating conditions whereby a letter grade, from A (the best) to F (the worst), is assigned. These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. In general, LOS A represents free-flow conditions with no congestion, and LOS F represents severe congestion and delay under stop-and-go conditions. Table IV.O-2 displays the delay range associated with each LOS category for signalized and unsignalized intersections.

Table IV.O-2
Intersection Level of Service Definitions

Level of Service	Description (for Signalized Intersections)	Average Delay (Seconds/Vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Operations with very low delay occurring with favorable traffic signal progression and/or short cycle lengths.	< 10.0	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0	> 10.0 to 15.0
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	> 15.0 to 25.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0	> 25.0 to 35.0
E	Operations with high delay values indicating poor progression, and long cycle lengths. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55.0 to 80.0	> 35.0 to 50.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0	> 50.0

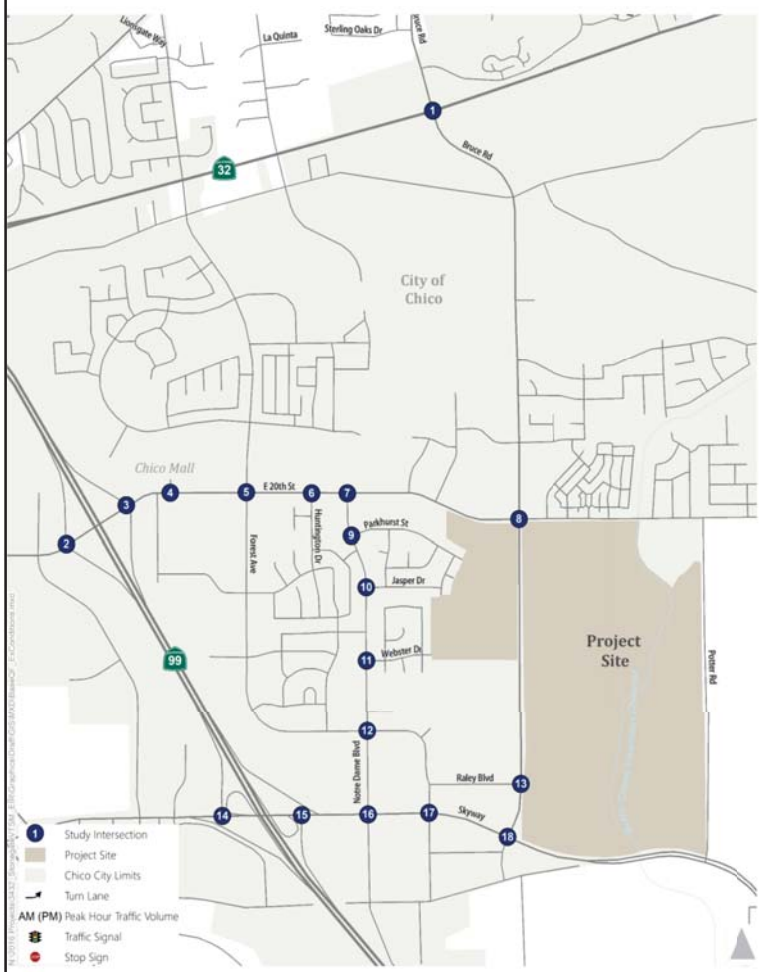
Note: LOS = level of service; V/C ratio= volume-to-capacity ratio

LOS at signalized intersections and roundabouts based on average delay for all vehicles. LOS at unsignalized intersections is reported for entire intersection and for minor street movement with greatest delay.

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

Existing Intersection Traffic Volumes

Figure IV.O-3 displays the existing AM and PM peak hour intersection traffic volumes, traffic controls, and lane configurations.



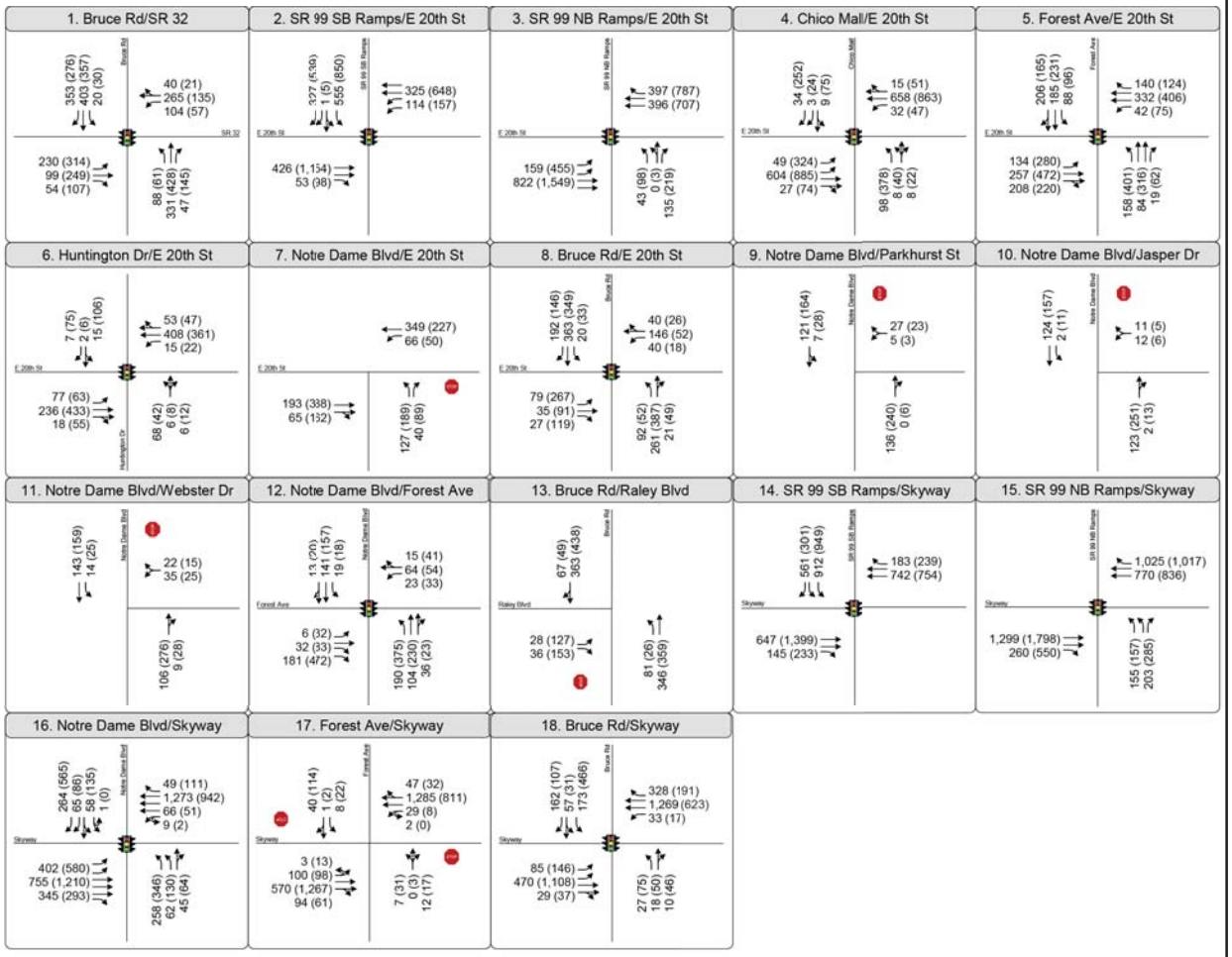


Figure IV.O-3 Peak Hour Traffic Volumes and Lane Configurations - Existing Conditions

Stonegate Vesting Tenative Subdivision
Map and GPA/Rezone
City of Chico, California

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Date: 3/28/18
Source: Fehr & Peers

Existing Intersection Operations

Table IV.O-3 shows the existing peak hour intersection operations at the study intersections.

Table IV.O-3
Intersection Operations – Existing Conditions

Intersection	Traffic Control	Peak Hour	Existing Conditions	
			Delay[1]	LOS
1. SR 32 / Bruce Rd.	Signalized	AM PM	30 24	C C
2. E 20th St. / SR 99 SB Ramps	Signalized	AM PM	9 17	A B
3. E 20th St. / SR 99 NB Ramps	Signalized	AM PM	8 14	A B
4. E 20th St. / Chico Mall	Signalized	AM PM	12 21	B C
5. E 20th St. / Forest Ave.	Signalized	AM PM	29 46	C D
6. E 20th St. / Huntington Drive	Signalized	AM PM	7 8	A A
7. E 20th St. / Notre Dame Blvd.	SSSC	AM PM	6 (29) 8 (39)	A (D) A (E)
8. E 20th St. / Bruce Rd.	Signalized	AM PM	19 20	B C
9. Notre Dame Blvd. / Parkhurst St.	SSSC	AM PM	1 (10) 1 (10)	A (A) A (B)
10. Notre Dame Blvd. / Jasper Drive	SSSC	AM PM	1 (10) 0 (10)	A (A) A (B)
11. Notre Dame Blvd. / Webster Drive	SSSC	AM PM	2 (10) 1 (11)	A (B) A (B)
12. Notre Dame Blvd. / Forest Ave.	Signalized	AM PM	13 14	B B
13. Bruce Rd. / Raley Blvd.	SSSC	AM PM	2 (19) 9 (37)	A (C) A (E)
14. Skyway / SR 99 SB Ramps	Signalized	AM PM	11 14	B B
15. Skyway / SR 99 NB Ramps	Signalized	AM PM	6 11	A B
16. Skyway / Notre Dame Blvd.	Signalized	AM PM	23 30	C C
17. Skyway / Forest Ave.	SSSC	AM PM	3 (>200) 15 (>200)	A (F) C (F)
18. Skyway / Bruce Rd.	Signalized	AM PM	17 21	B C

Notes: LOS = Level of Service. SSSC = Side-Street Stop-Controlled

[1]For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For SSSC intersections, the LOS and control delay for the worst movement is shown in parentheses next to the average intersection LOS and delay. Impacts to intersections are determined based on the overall LOS and average delay. Intersection LOS and delay is calculated based on the procedures and methodology contained in the HCM 2010 (TRB, 2010).

Source: Fehr & Peers, 2017

As shown, all intersections operate at LOS C or better during both AM and PM peak hours, except for Intersection 5 – E 20th Street / Forest Avenue which operates at LOS D during the PM peak hour. The minor street worst movement delay for Intersection 7 and 13 currently operate at LOS E during the PM peak hour, and the worst movement for Intersection 17 operates at LOS F during both the AM and PM peak hours. However, the overall delay at intersections 7, 13, and 17 is LOS C or better.

Freeway Level of Service Definitions

Per Caltrans standards, freeway segment operations were evaluated using methodologies from the *Highway Capacity Manual* (Transportation Research Board, 2010). The LOS for a basic freeway segment is based on the vehicle density (passenger cars/lane/mile) as shown in Table IV.O-4. Freeway merge segments are those where two traffic streams combine into one single stream, while freeway diverge segments are those where one traffic stream separates into two separate streams. The performance LOS for merge and diverge sections is computed in one of two ways. If both the ramp and the adjacent freeway mainline segment are under capacity, then LOS is based on the density of the ramp junction. If either the ramp or the adjacent freeway mainline segment have reached (or exceed) capacity, then the merge/diverge segment is considered to operate at LOS F regardless of the computed ramp junction density. The LOS for ramp junctions is based on the vehicle density (passenger cars/lane/mile) as shown in Table IV.O-4.

The performance of freeway ramp weaving segments under future conditions was analyzed using the Leisch methodology as defined in the *Highway Capacity Manual* (Transportation Research Board, 2010).

Table IV.O-4
Freeway Level of Service Definitions

Level of Service	Mainline (Density)[1]	Ramp Junctions (Density)[1]
A	< 11	< 10
B	> 11 to 18	> 10 to 20
C	> 18 to 26	> 20 to 28
D	> 26 to 35	> 28 to 35
E	> 35 to 45	> 35
F	> 45 or Demand exceeds capacity[2]	Demand exceeds capacity[2]

Notes:

[1] Density expressed in passenger car equivalents per hour per mile per lane.

[2] Occurs when freeway demand exceeds upstream (diverge) or downstream (merge) freeway segment capacity, or if off-ramp demand exceeds off-ramp capacity.

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

Existing Freeway Volumes

Figure IV.O-4 displays the existing AM and PM peak hour freeway volumes.

Existing Freeway Operations

Table IV.O-5 displays the existing freeway operations under the AM and PM peak hours.

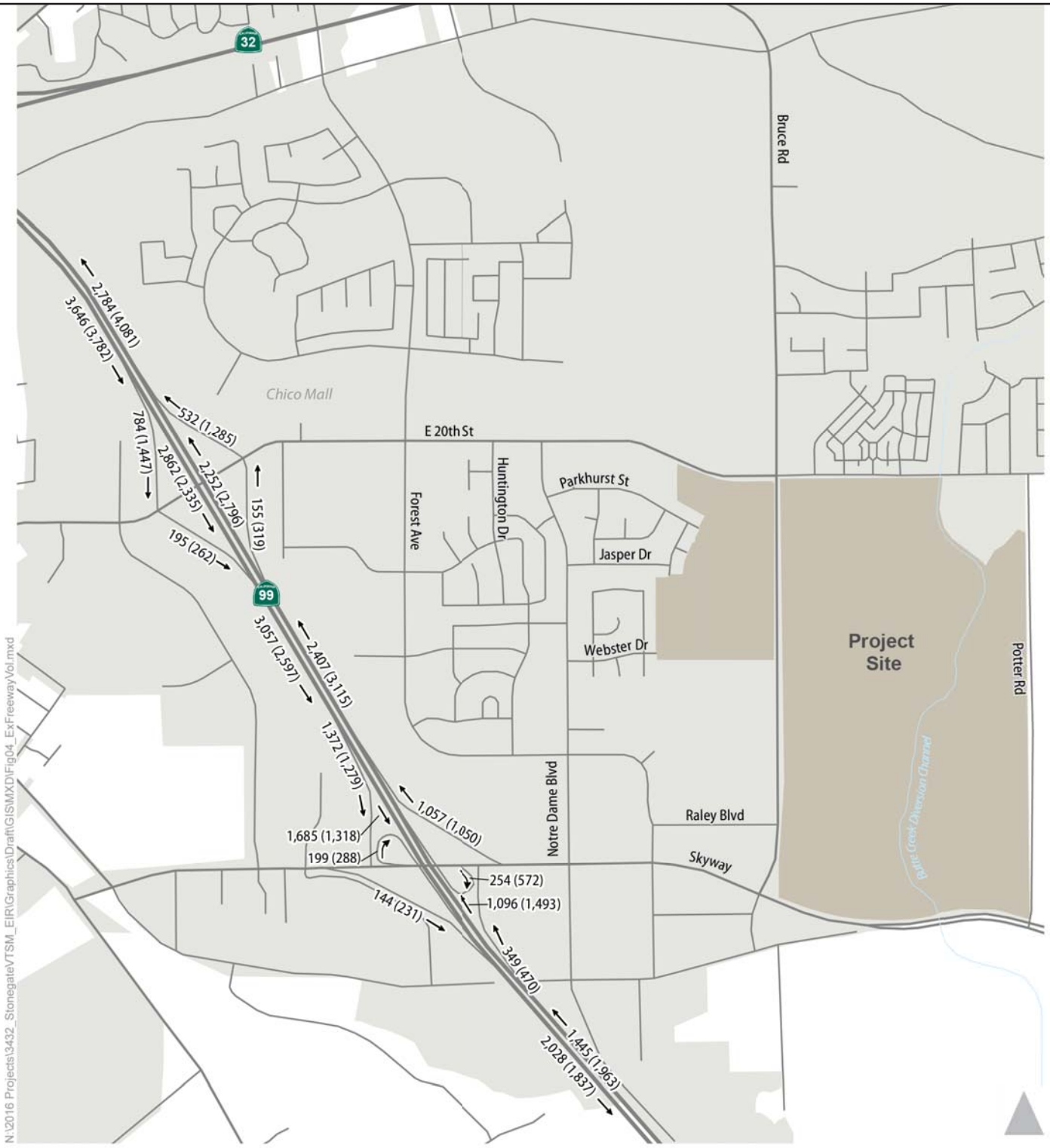

Figure IV.O-4 Existing Freeway Volumes

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Date: 3/28/18
Source: Fehr & Peers

Table IV.O-5
Freeway Operations – Existing Conditions

Freeway	Segment	Type	Peak Hour	Existing Conditions	
				Density[1]	LOS
State Route 99 Northbound	South of Skyway	Basic	AM PM	13.8 17.4	B B
	Skyway Off-Ramp	Diverge	AM PM	18.8 22.8	B C
	Skyway	Basic	AM PM	10.5 13.4	A B
	Skyway Loop On-Ramp	Merge	AM PM	16.8 21.8	B C
	Skyway Slip On-Ramp	Merge	AM PM	25.7 29.9	C D
	Skyway to E 20th Street	Basic	AM PM	23.1 27.1	C D
	E 20th Street Off-Ramp	Diverge	AM PM	29.1 31.8	D D
	E 20th St	Basic	AM PM	21.6 22.8	C C
	E 20th Street On-Ramp	Merge	AM PM	30.9 36.3	D E
	North of E 20th Street	Basic	AM PM	27.3 37.7	D E
State Route 99 Southbound	North of E 20th Street	Basic	AM PM	38.2 37.0	E E
	E 20th Street Off-Ramp	Diverge	AM PM	40.6 39.9	E E
	E 20th Street	Basic	AM PM	26.7 20.4	D C
	E 20th Street On-Ramp	Merge	AM PM	31.5 25.7	D C
	E 20th Street to Skyway	Basic	AM PM	29.5 23.0	D C
	Skyway Off-Ramp	Diverge	AM PM	35.3 29.3	E D
	Skyway	Basic	AM PM	15.8 11.9	B B
	Skyway Loop On-Ramp	Merge	AM PM	20.7 16.9	C B
	Skyway On-Ramp	Merge	AM PM	22.1 19.1	C B
	South of Skyway	Basic	AM PM	19.0 16.2	C B

Notes:
[1] Density expressed in passenger car equivalents per hour per mile per lane.
Source: Fehr & Peers, 2017

As shown, all freeway mainline, merge, and diverge segments operate at LOS E or better during the AM and PM peak hours.

Existing Off-Ramp Queues

Freeway off-ramp queueing was analyzed using the procedures and methodologies contained in the *Highway Capacity Manual* (Transportation Research Board, 2010). These methodologies were applied using the SimTraffic microsimulation software program. Reported results are based on an average of 10 runs. Table IV.O-6 displays the existing freeway off-ramp queuing within the study area during the AM and PM peak hours. As shown, all study freeway off-ramp queues remain within the available storage area during both peak hours.

Table IV.O-6
Freeway Off-Ramp Queueing – Existing Conditions

Facility	Storage Length (feet)	Peak Hour	Existing Conditions
			Queue (feet)
SR 99 Southbound Off-Ramp at E. 20th St	1,350	AM PM	175 300
SR 99 Northbound Off-Ramp at E. 20th St	1,350	AM PM	125 175
SR 99 Southbound Off-Ramp at Skyway Rd	1,500	AM PM	250 275
SR 99 Northbound Off-Ramp at Skyway Rd	1,275	AM PM	150 200

Notes: Maximum queue is calculated using an average of 10 SimTraffic runs. Storage length is measured using aerial imagery.
Source: Fehr & Peers, 2017

Bicycle System

The following types of bicycle facilities exist within the study area:

- Class I – A Class I facility, commonly referred to as a Bikeway or Bike Path, is a facility separated from automobile traffic for the exclusive use of bicyclists. Class I facilities can be designed to accommodate other modes of transportation, including pedestrians and equestrians, in which case they are referred to as shared use paths.`
- Class II – Class II facilities, commonly referred to as Bike Lanes, are dedicated facilities for bicyclists immediately adjacent to automobile traffic. Class II facilities are identified with striping, pavement markings and signage.
- Class III – Class III facilities, commonly referred to as Bike Routes, are on-street routes where bicyclists and automobiles share the road. They are identified with pavement markings and signage, and are typically assigned to low-volume and/or low-speed streets.

The project site is currently served by a variety of bicycle facilities, as depicted in Figure IV.O-5. Class II bike lanes exist on Bruce Road immediately north of the project site, on E 20th Street, and on Skyway west of Bruce. The project proposes to include bike lanes on Bruce Road through the project site from E 20th Street to Skyway. Nearby Class II bike lanes exist on Notre Dame Boulevard, and Class I paths along Potter Road to the east and Chico Bike Path off of Bruce Road to the north, providing connectivity between the project site and destinations throughout Chico.

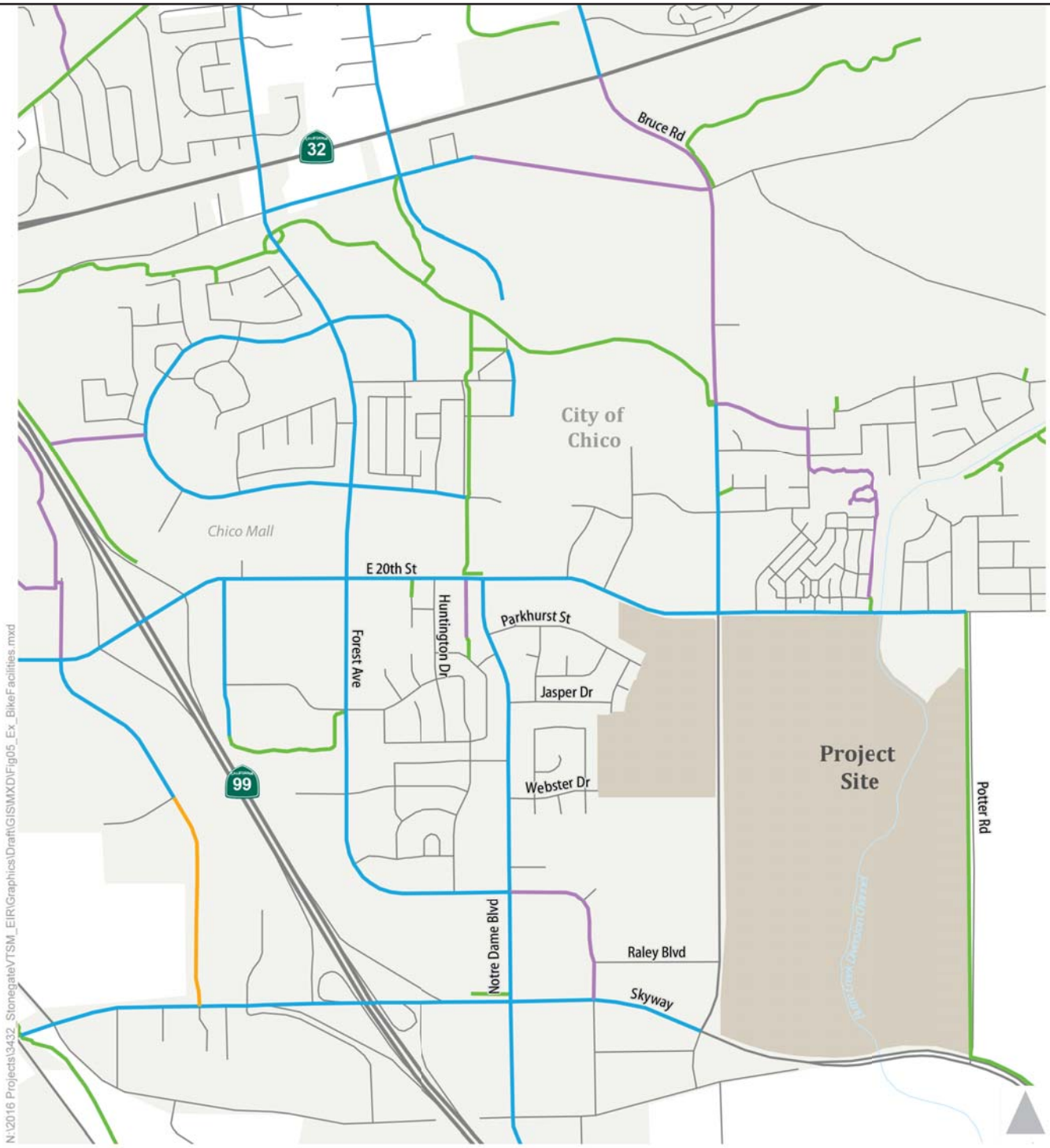

Figure 5

Figure IV.O-5 Existing Bicycle Facilities

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Stonegate Vesting Tenative Subdivision
Map and GPA/Rezone
City of Chico, California

Date: 3/28/18
Source: Fehr & Peers

Pedestrian System

Crosswalks are present at local signalized intersections in the study area. Sidewalks are present along E 20th Street west of Notre Dame Boulevard, and are intermittent to Bruce Road. Sidewalks do not exist along Bruce Road from E 20th Street to Raley Boulevard. Figure IV.O-6 displays the existing pedestrian facilities and areas of missing sidewalks along key roadways within the study area.

Transit System

Local Butte Regional Transit (B-Line) provides bus service in Chico and throughout Butte County. Figure IV.O-6 displays the existing transit routes and stops in the study area.

Seven B-Line routes serve nearby bus stops at E 20th Street / Bruce Road, Skyway / Bruce Road, and Notre Dame Boulevard / Forest Ave. Table IV.O-7 summarizes the existing transit service near the project site.

Table IV.O-7
Existing Transit Service Schedule Summary

Route	Weekday		Saturday		Sunday	
	Freq. (min)	Span	Freq. (min)	Span	Freq. (min)	Span
5 (E. 8th Street)	30 – 60	7 AM – 8 PM	60	8 AM – 7 PM	-	-
7 (Bruce / Manzanita)	30 – 180	7 AM – 5 PM	-	-	-	-
14 (Park / Forest / MLK)	30 – 60	6 AM – 10 PM	60	8 AM – 7 PM	-	-
17 (Park / MLK / Forest)	60	7 AM – 6 PM	60	8 AM – 6 PM	-	-
20 (Chico – Oroville)	60	6 AM – 8 PM	120	8 AM – 6 PM	120	8 AM – 6 PM
40 (Paradise – Chico)	60 – 120	7 AM – 7 PM	120	8 AM – 7 PM	120	10 AM – 6 PM
41 (Paradise Pines – Chico)	60 – 120	6 AM – 7 PM	180	10 AM – 6 PM	-	-

Notes: Where applicable, service frequency is provided for peak/off peak time periods
Source: Butte Regional Transit, 2017

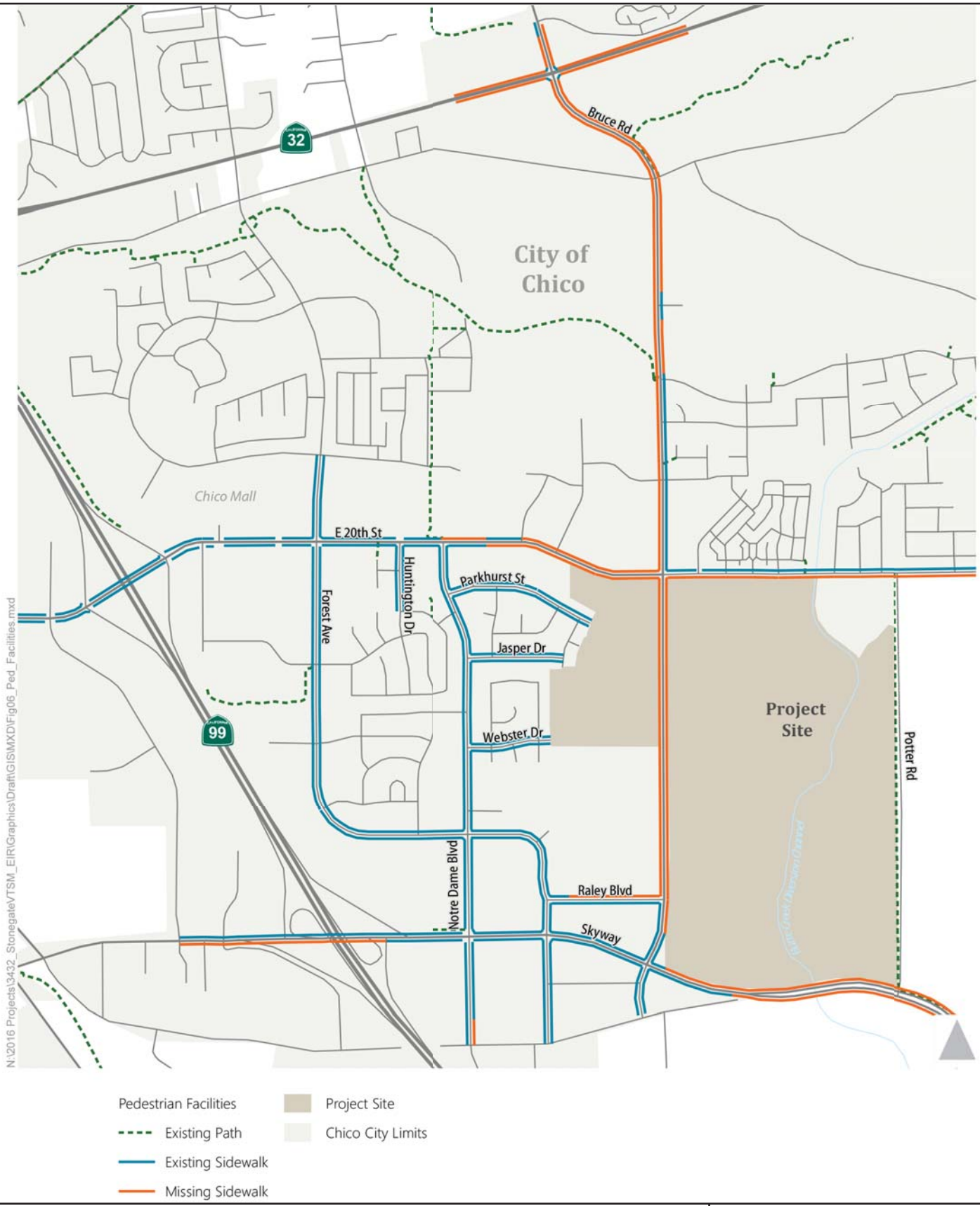

Figure IV.O-6 Existing Pedestrian Facilities

Stonegate Vesting Tenative Subdivision
Map and GPA/Rezone
City of Chico, California

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Date: 3/28/18
Source: Fehr & Peers

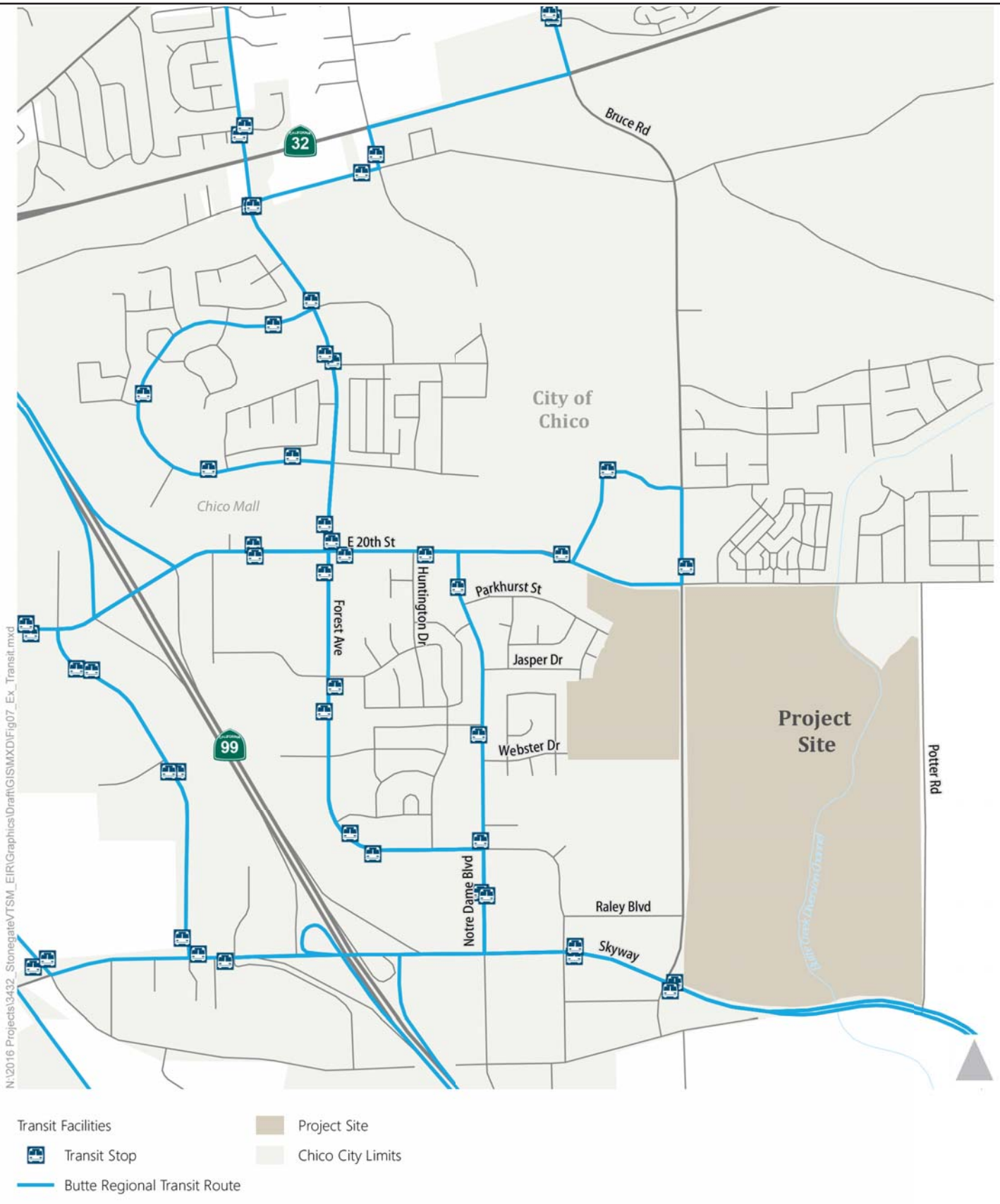

Figure IV.O-7 Existing Transit Facilities

Stonegate Vesting Tenative Subdivision
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Date: 3/28/18
Source: Fehr & Peers

REGULATORY SETTING

Federal Regulations

No federal plans, policies, regulations, or laws related to transportation and circulation are applicable to the Stonegate Vesting Tentative Map and General Plan Rezone project.

State Regulations

Caltrans owns, operates, and maintains SR 99 mainline, ramp, and ramp junction terminal facilities within the study area. Caltrans is also responsible for freeway ramp junction terminal intersections along SR 99 at E 20th Street and Skyway Road, as well as the highway and intersections along SR 32. As such, the following Caltrans planning and policy documents provide guidance on expectations related to traffic operations relevant to this analysis and the potential effects of the proposed project.

District System Management Plan

The District System Management Plan (Caltrans, 2013) sets forth the long-term (20-year) policy direction for Caltrans District 3 related to system maintenance, system completion, and congestion relief. The plan identifies two improvement projects within the project study area:

- Widening of SR 32 to 4 lanes with intersection modifications from Fir Street to El Monte Avenue
- Widening of SR 32 to 4 lanes with intersection modifications from El Monte Avenue to Yosemite Drive
- Construction of auxiliary lanes on SR 99 between Skyway Road and E 20th Street
- Construction of a Class I bike facility paralleling SR 99 between Business Lane and Cohasset Road

The plan supports complete streets development, but only includes performance expectations related to vehicle travel. In general, the plan establishes a LOS E threshold for urban areas but notes that individual transportation corridor concept reports (TCCRs) for each State route set final thresholds. The document notes that once facilities worsen to LOS F, it becomes difficult to measure further degradation to any degree of accuracy. Therefore, other performance measures can be used to define thresholds for system planning and CEQA purposes. These include vehicle travel time, vehicle hours of delay (VHD), travel reliability (i.e. the degree of variation in travel time due to congestion and non-recurring events), and lost productivity (i.e. ability of corridor to deliver travelers/good movement). The document mentions the need to develop thresholds of significance to use these measures for defining significant impacts for facilities not operating at the concept LOS, but does not identify specific thresholds.

Transportation Corridor Concept Report, State Route 99

A Transportation Corridor Concept Report (TCCR) is a long-term planning document that the District Transportation Planning Office prepares for each State highway, or portion thereof, in its

jurisdiction. The purpose of a TCCR is to plan how a highway will be managed so that it operates at the targeted level of service over a twenty-year period. The Transportation Corridor Concept Report, State Route 99 (Caltrans, 2017) establishes the following concept LOS standards for SR 99 segments in the project study area:

- Southgate Avenue to North of Eaton Road – LOS F

Transportation Corridor Concept Report, State Route 32

The Transportation Corridor Concept Report, State Route 32 (Caltrans, 2014) establishes the following concept LOS standards for SR 32 intersection with Bruce Road in the project study area:

- Fir Street to Yosemite Drive (Segment 11) – LOS E

Regional Regulations

The Butte County Association of Governments (BCAG) is responsible for the preparation of, and updates to, the Metropolitan Transportation Plan and Sustainable Communities Strategy (MTP/SCS) and the corresponding Regional Transportation Improvement Program (RTIP). The MTP/SCS provides a 20-year transportation vision and corresponding list of projects. The RTIP identifies short-term projects (5-year horizon) in more detail.

Local Regulations

The City of Chico maintains jurisdiction over local roadways, intersections, and non-motorized transportation facilities surrounding the project site.

City of Chico General Plan

The City of Chico General Plan (Chico of Chico, 2011) provides long-range direction and policies for the use of land within Chico. The Circulation Element of the General Plan provides the framework for achieving the City's transportation system goals. The Circulation Element outlines the goals and policies necessary for the City to achieve its vision of a multimodal transportation network that accommodates vehicles, transit, bicycles, and pedestrians. For the purposes of this EIR, the goals and policies of this document were used in developing the impact significance criteria.

The City of Chico General Plan establishes the following principles, policies, and actions related to transportation that are applicable to the proposed project:

Policy CIRC-1.1 (Transportation Improvements) – Safely and efficiently accommodate traffic generated by development and redevelopment associated with build-out of the General Plan Land Use Diagram.

> Action CIRC-1.1.1 (Road Network) – Enhance existing roadways and intersections and develop the roadway system shown in Figure CIRC-1 (Roadway System Map) over the life of the General Plan as needed to accommodate development.

Policy CIRC-1.2 (Project-Level Circulation Improvements) – Require new development to finance and construct internal and adjacent roadway circulation improvements as necessary to mitigate project impacts, including roadway, transit, pedestrian, and bicycle facilities.

Policy CIRC-1.3 (Citywide Circulation Improvements) – Collect the fair share cost of circulation improvements necessary to address cumulative transportation impacts, including those to state highways, local roadways, and transit, pedestrian and bicycle facilities, through the City's development impact fee program.

Policy CIRC-1.4 (Level of Service Standards) – Maintain LOS D or better for roadways and intersections at the peak PM period, except as specified below:

- LOS E is acceptable for City streets and intersections under the following circumstances:
    - Downtown streets within the boundaries identified in Figure DT-1 of the Downtown Element.
    - Arterials served by scheduled transit.
    - Arterials not served by scheduled transit, if bicycle and pedestrian facilities are provided within or adjacent to the roadway.
- Utilize Caltrans LOS standards for Caltrans' facilities.
- There are no LOS standards for private roads.
- Exceptions to the LOS standards above may be considered by the City Council where reducing the level of service would result in a clear public benefit. Such circumstances include, but are not limited to, the following:
    - If improvements necessary to achieve the LOS standard results in impacts to a unique historical resource, a highly sensitive environmental area, requires infeasible right-of-way acquisition, or some other unusual physical constraint exists.
    - If the intersection is located within a corridor that utilizes coordinated signal timing, in which case, the operation of the corridor as a whole should be considered.

Policy CIRC-2.1 (Complete Streets) – Develop an integrated, multimodal circulation system that accommodates transit, bicycles, pedestrians, and vehicles; provides opportunities to reduce air pollution and greenhouse gas emissions; and reinforces the role of the street as a public space that unites the City.

> Action CIRC-2.1.3 (Multimodal Connections) – Provide connections between and within existing and new neighborhoods for bicycles, pedestrians, and automobiles.

Policy CIRC-2.2 (Circulation Connectivity and Efficiency) – Provide greater street connectivity and efficiency for all transportation modes.

Action CIRC-2.2.1 (Connectivity in Project Review) – New development shall include the following internal circulation features:

- A grid or modified grid-based primary street system. Cul-de-sacs are discouraged, but may be approved in situations where difficult site planning issues, such as odd lot size, topography, or physical constraints exist or where their use results in a more efficient use of land, however in all cases the overall grid pattern of streets should be maintained;
- Traffic-calming measures, where appropriate;
- Roundabouts as alternative intersection controls, where appropriate;
- Bicycle and pedestrian connections to adjacent streets, trails, public-spaces, and bicycle paths; and
- Short block lengths consistent with City design standards.

Action CIRC-2.2.2 (Traffic Management) – Perform routine, ongoing evaluation of the street traffic control system, with emphasis on traffic management, such as signal timing and coordination or the use of roundabouts, to optimize traffic flow along arterial corridors and reduce vehicle emissions.

Policy CIRC-3.3 (New Development and Bikeway Connections) – Ensure that new residential and non-residential development projects provide connections to the nearest bikeways.

Action CIRC-3.3.1 (Bikeway Requirements) – Require pedestrian and bicycle connections to the Citywide bikeway system every 500 feet, where feasible, as part of project approval and as identified in the Bicycle Master Plan.

Policy CIRC-4.2 (Continuous Network) – Provide a pedestrian network in existing and new neighborhoods that facilitates convenient and continuous pedestrian travel free from major impediments and obstacles.

Policy CIRC-5.3 (Transit Connectivity in Projects) – Ensure that new development supports public transit.

Action CIRC-5.3.2 (Transit Improvements for New Development) – During project review, consult with BCAG to determine appropriate requirements for the installation of stops and streetscape improvements, if needed to accommodate transit.

Chico Urban Area Bicycle Plan

The Chico Urban Area Bicycle Plan (City of Chico, 2012) establishes goals and objectives for recreational and transportation-related bicycle use in Chico. The plan identifies future on- and off-street bicycle facility improvements.

ENVIRONMENTAL IMPACTS

This section describes the analysis techniques, assumptions, and results used to identify potential significant impacts of the proposed project on the transportation system. Transportation and circulation impacts are described and assessed, and mitigation measures are recommended for impacts identified as significant or potentially significant.

Project Analysis Methodology

The transportation and circulation analysis methodology uses the anticipated travel characteristics of the project, trip generation and mode split assumptions, and vehicle trip distribution, as described below.

Project Trip Generation

Project trip generation consists of various trip types: primary trips, internal trips, and pass-by trips. The project will also generate trips of different travel modes: vehicle, pedestrian, bicycle, and transit. The project's intersection impacts was analyzed based on the net changes to the number of vehicle trips on the surrounding roadway network.

Gross Trips

Gross trips were first calculated to determine all of the project trips that would be generated before any adjustments are made to account for internalization, travel mode, and pass-by trips. Trip generation was determined using the rates calculated from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (9th Edition). The proposed single-family residential units (both small and large lots lots) are captured in the "Single-Family Detached Housing" land use category (ITE land use 210). The proposed multi-family residential units are represented by the "Apartment" land use category (ITE land use 220). The proposed medical land uses are estimated using the "Medical-Dental Office Building" land use category (ITE land use 720). The proposed commercial land uses are estimated using the "Shopping Center" land use category (ITE land use 820).

Open space is not assumed to generate trips. The proposed 3.3-acre park space is assumed to serve the local neighborhood and is not expected to generate external vehicle trips beyond the project boundary during the weekday peak hours.

Table IV.O-8 shows the gross trips calculated for the proposed project land uses. As shown, the proposed project is estimated to generate 1,213 gross AM peak hour trips, 2,377 gross PM peak hour trips, and 25,293 gross daily trips.

Table IV.O-8
Gross Project Trips

Land Use	ITE Land Use Code	Quantity[1]	Trips						
			Daily	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out	Total
Single Family Residential	210	469 du	4,353	85	254	339	266	156	422
Multi-Family Residential	220	233 du	1,536	24	94	118	95	51	146
Commercial (Medical Office)	720	205 ksf	7,407	387	103	490	205	527	732
Commercial (Retail)	820	240 ksf	11,997	165	101	266	517	560	1,077
Gross Trips (Residential) [2]			*5,889*	*109*	*348*	*457*	*361*	*207*	*568*
Gross Trips (Commercial) [2]			*19,404*	*552*	*204*	*756*	*722*	*1,087*	*1,809*
Total Gross Trips			**25,293**	**661**	**552**	**1,213**	**1,083**	**1,294**	**2,377**

Notes:

[1] du = dwelling unit, ksf = 1,000 square feet.

[2] Gross trips are based on Trip Generation Manual (Institute of Transportation Engineers, 2012) for all residential and commercial (retail) land uses following the fitted curve equations, and for commercial (medical office) land use following the average rate.

Source: Fehr & Peers, 2017

Internalization and Non-Auto Travel Modes

The primary objective of the traffic analysis is to analyze impacts to the adjacent roadway system. Therefore, it is reasonable to reduce the gross trip generation volumes to account for only the inbound vehicular trips entering the project boundary, and the outbound vehicular trips exiting the project boundary. It is expected that some of the gross trips would remain internal within the project boundary between the complementary mix of residential and commercial land uses. A portion of the project trips are also expected to be made using non-auto travel modes (i.e. walking, bicycling, and transit). The internalization of project trips and the shift of project trips to non-auto travel modes was estimated using the Mixed-Use Trip Generation Model (MXD+), which was developed for the US Environmental Protection Agency (EPA) to estimate internal trip-making and external trips by non-auto travel modes. This model was developed by consultants and academic researchers based on empirical evidence at 240 mixed-use projects located across the U.S. The model considers various built environment variables such as land use density, regional location, proximity to transit, and various design variables when calculating the project's internal trips, and external trips made by auto, transit, and non-motorized modes. The MXD+ model has been applied in numerous EIRs throughout California.

Table IV.O-9 shows the internal trip reduction for the project, and shift of trips to walking, bicycle, and transit. After accounting for these trip types, the proposed project is expected to generate 1,080 AM peak hour, 1,973 PM peak hour, and 23,497 daily external vehicle trips.

Table IV.O-9
Project Internalization and Non-Auto Trips

Trip Type	Trips						
	Daily	AM Peak Hour			PM Peak Hour		
	Total	In	Out	Total	In	Out	Total
Gross Trips (Residential)	5,889	109	348	457	361	207	568
Gross Trips (Commercial)	19,404	552	204	756	722	1,087	1,809
Gross Trips	**25,293**	**661**	**552**	**1,213**	**1,083**	**1,294**	**2,377**
Reduction for Internal Trips (Residential) [1]	-634	-11	-35	-46	-102	-62	-164
Reduction for Internal Trips (Commercial) [1]	-634	-35	-11	-46	-62	-102	-164
Total Reduction for Internal Trips (5%)	**-1,268**	**-46**	**-46**	**-92**	**-164**	**-164**	**-328**
External Trips All Travel Modes (Residential)	5,255	98	313	411	259	145	404
External Trips All Travel Modes (Commercial)	18,770	517	193	710	660	985	1,645
Total External Trips All Travel Modes	**24,025**	**615**	**506**	**1,121**	**919**	**1,130**	**2,049**
Shift to Walk/Bike/Transit (Residential) [2]	-123	-4	-12	-16	-12	-7	-18
Shift to Walk/Bike/Transit (Commercial) [2]	-405	-19	-7	-26	-23	-35	-58
Total Shift to Walk/Bike/Transit Trips (2.1% Daily, 3.4% AM, 3.2% PM of Gross Trips)	**-528**	**-22**	**-19**	**-41**	**-35**	**-41**	**-76**
External Vehicle Trips (Residential)	5,132	94	301	395	247	138	386
External Vehicle Trips (Commercial)	18,365	498	186	684	637	950	1,587
Total External Vehicle Trips	**23,497**	**593**	**487**	**1,080**	**884**	**1,089**	**1,973**

Notes:
[1] Internal trips based on MXD+ model output
[2] External trips made by walking, bicycling, and transit based on MXD+ model output
Source: Fehr & Peers, 2017

Pass-by Trips and Total New External Vehicle Trips

Pass-by trips apply only to the commercial retail land uses of the project. Pass-by trips are defined as trips that would occur on the roadway immediately adjacent to the project with or without the project; therefore, would not add any through traffic to an existing roadway.

The average pass-by trip reduction percentage of 34 percent for the "Shopping Center" land use category (ITE land use 820), as noted in the ITE Trip Generation Handbook (3rd Edition), was used to estimate the pass-by trips for the commercial retail land uses.

Table IV.O-10 shows the total new external vehicle trips (i.e. primary trips) after deducting for pass-by trips. The proposed project is projected to generate 998 AM Peak Hour, 1,654 PM Peak Hour, and 19,637 Daily new external vehicle trips.

Table IV.O-10
Pass-by and Total New External Vehicle Trips Internalization and Non-Auto Trips

Trip Type	Trips						
	Daily	AM Peak Hour			PM Peak Hour		
	Total	In	Out	Total	In	Out	Total
External Vehicle Trips (Residential)	5,132	94	301	395	247	138	386
External Vehicle Trips (Commercial)	18,365	498	186	684	637	950	1,587
Total External Vehicle Trips	**23,497**	**593**	**487**	**1,080**	**884**	**1,089**	**1,973**
Pass-by Trips (Residential)	-	-	-	-	-	-	-
Pass-by Trips (Commercial - Retail) [1]	-3,861	-51	-31	-82	-155	-166	-321
Total Pass-by Trips (34% of External Vehicle Trips)	**-3,861**	**-51**	**-31**	**-82**	**-155**	**-166**	**-321**
New External Vehicle Trips (Residential)	5,132	94	301	395	247	138	386
New External Vehicle Trips (Commercial)	14,504	448	155	602	482	784	1,266
Total New External Vehicle Trips	**19,637**	**542**	**456**	**998**	**729**	**922**	**1,652**

Notes:
[1] Pass-by trips for commercial retail is based on average pass-by trip percentage for Shopping Center (ITE land use 820) in the ITE Trip Generation Handbook (3rd Edition)
Source: Fehr & Peers, 2017

Project Vehicle Trip Distribution

The expected distribution of vehicle trips to and from the project is shown in Figure IV.O-8. The trip distribution was developed based on the following data sources:

- Review of existing directional travel patterns to and from nearby residential and commercial developments.
- Complementary land uses (i.e., employment, retail, and schools) within the study area.
- A 'project-only' traffic assignment from the base year BCAG regional travel model.

The base year version of the BCAG regional travel model was updated to incorporate the project roadway network and land uses. The model was refined to match the external trip generation presented in Table IV.O-10. Considering the size of the project's commercial land uses being complementary to nearby residential, and the new connection of project roadways to and from the adjacent neighborhood, the regional travel model was used for both adding the external project vehicle trips onto the roadway network and to account for changes in background travel patterns. The difference in traffic volumes from the base year model without the project (Existing conditions) and with the project (Existing Plus Project) were then added to the existing traffic counts to develop the Existing Plus Project forecasts.

As shown, a minor amount of project traffic would be added to the local roads in the adjacent neighborhood (Parkhurst Street, Jasper Drive, or Webster Drive). These project trips would come from the project residential units located between the existing neighborhood and Bruce Road. The majority of project trips would be added onto Bruce Road and divided among the major arterials of E 20th Street or Skyway, with some trips to and from the north along Bruce Road.

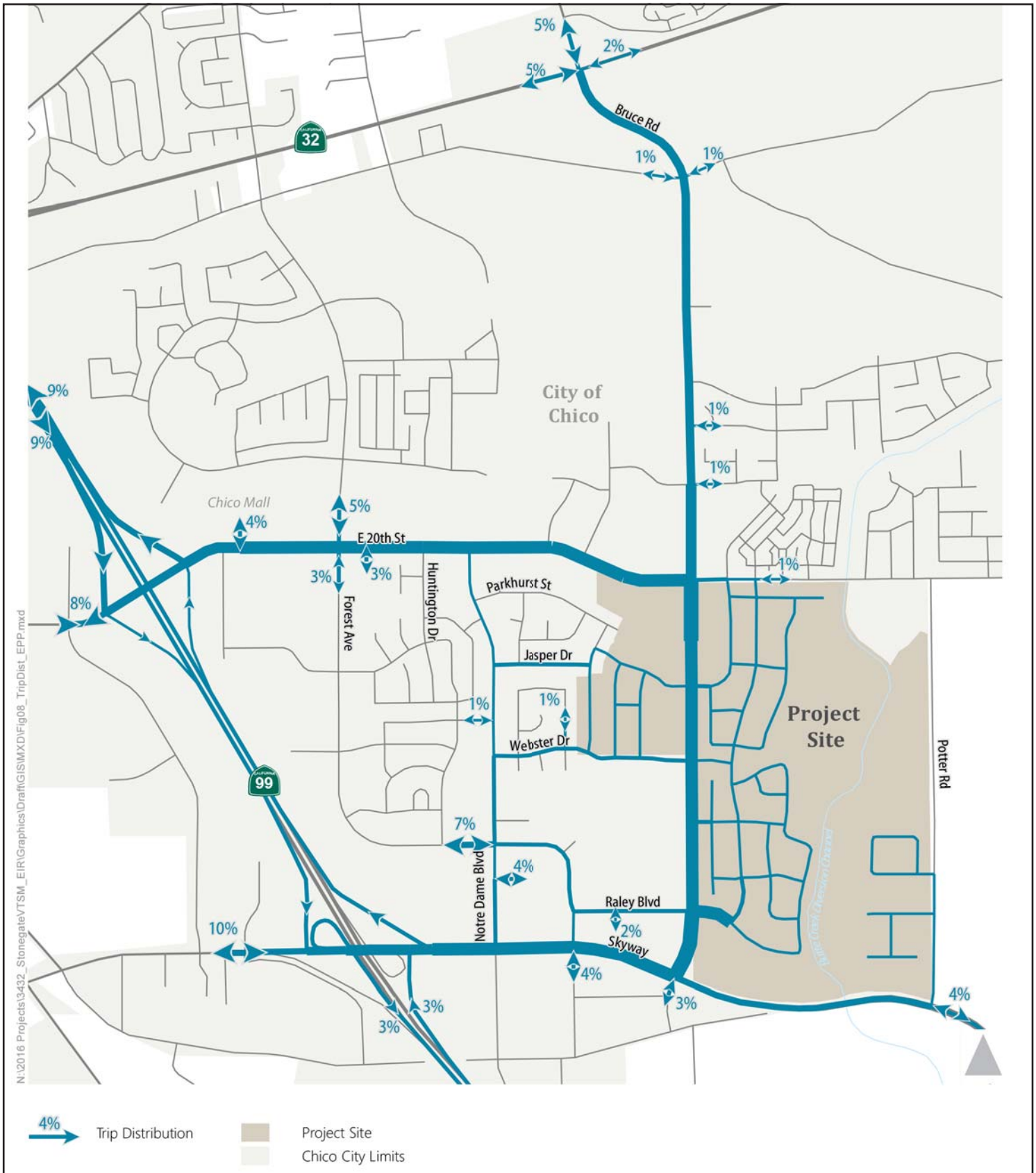


Figure IV.O-8 Project Trip Distribution - Existing Plus Project

Stonegate Vesting Tenative Subdivision
Map and GPA/Rezone
City of Chico, California

wra
ENVIRONMENTAL CONSULTANTS

Date: 3/28/18
Source: Fehr & Peers

Thresholds of Significance

The California Environmental Quality Act (CEQA) includes provisions for significance criteria related to traffic and circulation impacts. In accordance with Appendix G of the CEQA Guidelines, the proposed project could have a significant environmental impact if it were to:

a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);

b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways;

c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;

d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);

e. Result in inadequate emergency access;

f. Result in inadequate parking capacity; or

g. Conflict with adopted policies, plans, or programs supporting alternative transportation

Intersections

Project impacts to the local roadway system are considered significant if:

- The traffic generated by the project degrades LOS from acceptable (without the project) to unacceptable (with the project); or
- The LOS (without the project) is already (or projected to be) unacceptable and project generated traffic increases the average vehicle delay by five seconds or more.
- The project substantially increases hazards due to a design feature or incompatible use.

The City of Chico General Plan identifies LOS standards on local roadways in **Policy CIRC-1.4 (Level of Service Standards).** Considering the roadway and intersection conditions throughout the study area, a PM peak hour LOS E is designated as the minimum acceptable LOS standard for all study intersections under City of Chico jurisdiction (intersections 4, 5, 6, 7, 8, 9, 10, 11, 12, 16, 17, 18, and 19).

The Transportation Corridor Concept Report, State Route 32, establishes concept LOS standards for Caltrans Facilities in the project study area. At Intersection 1 (SR 32 / Bruce Rd), LOS D is designated as the minimum acceptable LOS under base year conditions, LOS F under horizon year 2034 conditions without the planned highway widening to four lanes, and LOS D under horizon year 2034 with highway widening to four lanes.

Table IV.O-11 displays the minimum acceptable LOS for each study intersection.

Table IV.O-11
Intersection Level of Service Standards

Intersection	Minimum Acceptable LOS
1. State Route 32 / Bruce Road	D
2. E 20th Street / State Route 99 Southbound Ramps	F
3. E 20th Street / State Route 99 Northbound Ramps	F
4. E 20th Street / Chico Mall	E
5. E 20th Street / Forest Avenue	E
6. E 20th Street / Huntington Drive	E
7. E 20th Street / Notre Dame Boulevard	E
8. E 20th Street / Bruce Road	E
9. Notre Dame Boulevard / Parkhurst St	E
10. Notre Dame Boulevard / Jasper Drive	E
11. Notre Dame Boulevard / Webster Drive	E
12. Notre Dame Boulevard / Forest Avenue	E
13. Bruce Road / Raley Boulevard	E
14. Skyway Road / State Route 99 Southbound Ramps	F
15. Skyway Road / State Route 99 Northbound Ramps	F
16. Skyway Road / Notre Dame Boulevard	E
17. Skyway Road / Forest Avenue	E
18. Skyway Road / Bruce Road	E
19. Bruce Road / Webster Drive	E

Sources: City of Chico General Plan (2011); Transportation Corridor Concept Report, SR 99 (Caltrans, 2017); Transportation Corridor Concept Report, SR 32 (Caltrans, 2014)

Freeway Facilities

Impacts to freeway mainline, ramp, and weave segments are considered significant if:

- The traffic generated by the project degrades LOS from acceptable (without the project) to unacceptable (with the project); or
- The LOS (without the project) is already (or projected to be) unacceptable and project generated traffic increases the density by more than five percent.

The Transportation Corridor Concept Report, State Route 99 establishes a concept LOS F standard for the freeway facilities in the project study area.

Freeway facility LOS standards apply to all freeway mainline, ramp, weave, and ramp terminal facilities, including study intersections 2, 3, 14, and 15.

Impacts to off-ramp queuing is considered significant if the queues extend past the storage length and onto the freeway mainline.

Bicycle Facilities

Impacts to bicycle facilities are considered significant if the proposed project would:

- Adversely affect existing or planned bicycle facilities; or
- Fail to adequately provide for access by bicycle.

Bicycle goals, policies, and existing and planned facilities are identified in the City of Chico General Plan and Chico Urban Area Bicycle Plan.

Pedestrian Circulation

Impacts to pedestrian facilities are considered significant if the proposed project would:

- Adversely affect existing or planned pedestrian facilities; or
- Fail to adequately provide for access by pedestrians.

Pedestrian goals, policies, and existing and planned facilities are identified in the City of Chico General Plan.

Public Transit Service and Facilities

Impacts to public transit service and facilities are considered significant if the proposed project would:

- Adversely affect public transit operations; or
- Fail to adequately provide for access to transit.

Public transit impacts are evaluated relative to existing Butte Regional Transit service and facilities and the future transit network identified in the Butte County Association of Governments (BCAG) Transit and Non-Motorized Plan (BCAG, 2015).

Transportation and Traffic Issues not Further Analyzed

The following issues were addressed in the Initial Study (see Appendix A) and Section IV.A of the Draft EIR, and were determined to result in a less-than-significant impact and not warrant further analysis:

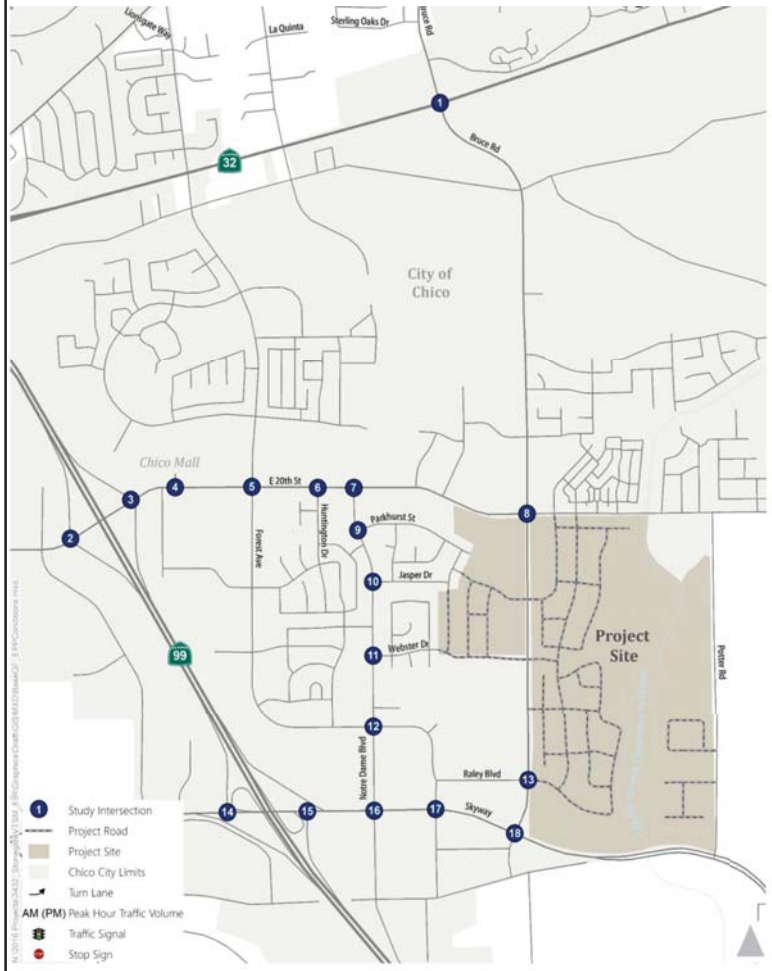
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

Project Impacts and Mitigation Measures

Potential impacts of the proposed project upon the existing transportation system are evaluated in this section based on the standards of significance and analysis results. Each impact is followed by a recommended mitigation measure to reduce the significance of the identified impact, if needed.

Impact TRANSPORTATION-1: Intersection Operations

Existing Plus Project intersection traffic volumes account for the addition of vehicle trips associated with the project and the redistribution of background traffic. Figure IV.O-9 displays the AM and PM peak hour intersection traffic volumes under Existing Plus Project conditions.



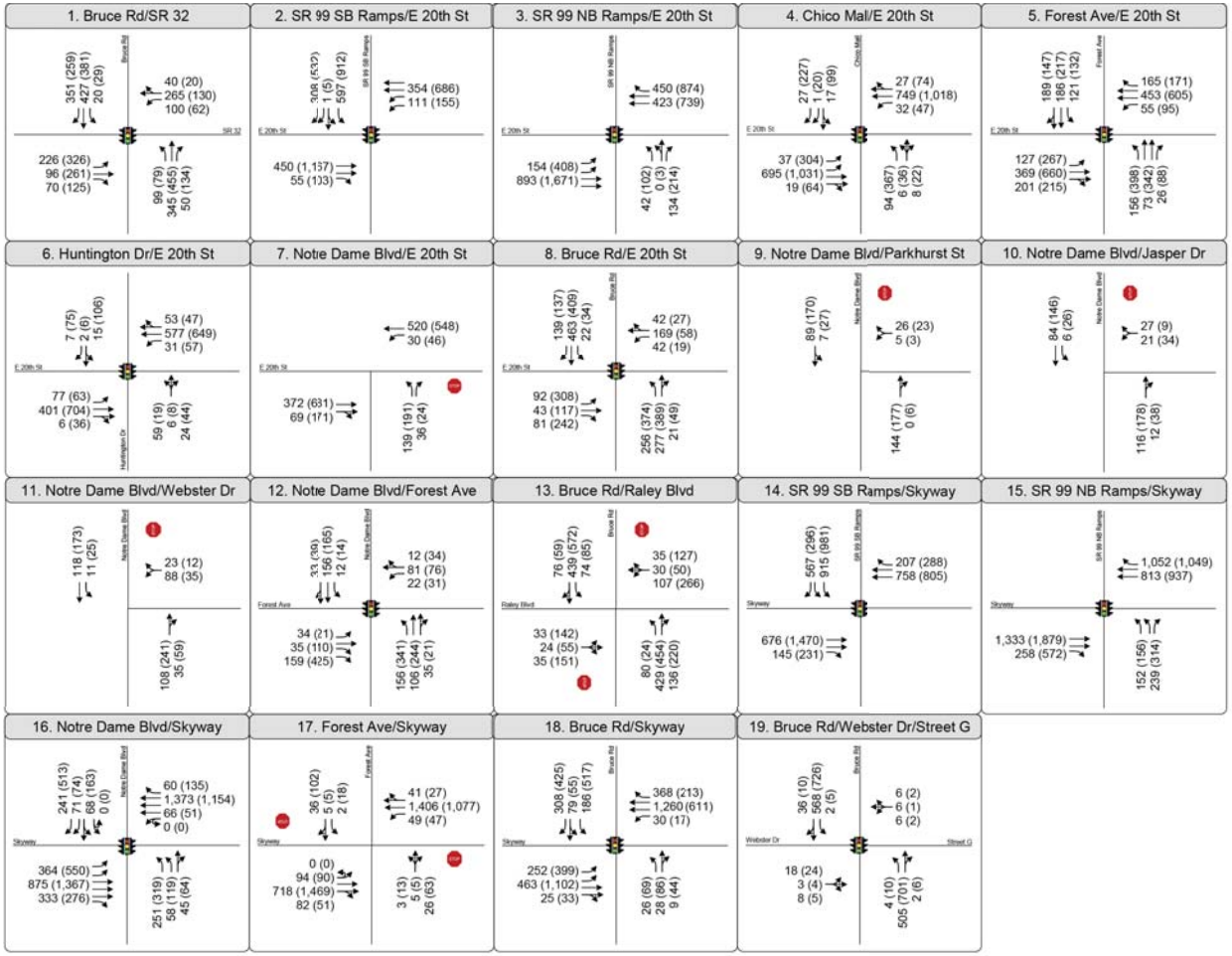


Figure IV.O-9 Peak Hour Traffic Volumes and Lane Configurations - Existing Plus Project

Stonegate Vesting Tenative Subdivision
Map and GPA/Rezone
City of Chico, California

ENVIRONMENTAL CONSULTANTS

Date: 3/28/18
Source: Fehr & Peers

Existing Plus Project traffic operations were analyzed utilizing the traffic volumes shown in Figure IV.O-9. Table IV.O-12 presents the Existing Plus Project peak hour intersection operations at the study intersections.

Table IV.O-12
Intersection Operations – Existing Plus Project

Intersection	Traffic Control	Peak Hour	Existing Conditions		Existing Plus Project	
			Delay[1]	LOS	Delay[1]	LOS
1. SR 32 / Bruce Rd.	Signalized	AM PM	30 24	C C	37 25	D C
2. E 20th St. / SR 99 SB Ramps	Signalized	AM PM	9 17	A B	10 18	A B
3. E 20th St. / SR 99 NB Ramps	Signalized	AM PM	8 14	A B	9 16	A B
4. E 20th St. / Chico Mall	Signalized	AM PM	12 21	B C	10 24	A C
5. E 20th St. / Forest Ave.	Signalized	AM PM	29 46	C D	24 49	C D
6. E 20th St. / Huntington Drive	Signalized	AM PM	7 8	A A	8 9	A A
7A. E 20th St. / Notre Dame Blvd.	SSSC[2]	AM PM	6 (29) 8 (39)	A (D) A (E)	11 (87) **51 (>200)**	B (F) **F (F)**
7B. E 20th St. / Notre Dame Blvd.	Signalized	AM PM	- -	- -	7 8	A A
8A. E 20th St. / Bruce Rd.	Signalized	AM PM	19 20	B C	32 42	C D
8B. E 20th St. / Bruce Rd.	Signalized (upgraded)	AM PM	- -	- -	20 19	B B
8C. E 20th St. Bruce Rd.	Signalized (upgraded)	AM PM	-	-	19 19	B B
9. Notre Dame Blvd. / Parkhurst St.	SSSC	AM PM	1 (10) 1 (10)	A (A) A (B)	1 (10) 1 (10)	A (A) A (A)
10. Notre Dame Blvd. / Jasper Dr.	SSSC	AM PM	1 (10) 0 (10)	A (A) A (B)	2 (10) 2 (11)	A (A) A (B)
11. Notre Dame Blvd. / Webster Dr.	SSSC	AM PM	2 (10) 1 (11)	A (B) A (B)	3 (11) 1 (11)	A (B) A (B)
12. Notre Dame Blvd. / Forest Ave.	Signalized	AM PM	13 14	B B	13 29	B C
13A. Bruce Rd. / Raley Blvd.	SSSC	AM PM	2 (19) 9 (37)	A (C) A (E)	**126 (>200)** **>200 (>200)**	**F (F)** **F (F)**
13B. Bruce Rd. / Raley Blvd.	Signalized	AM PM	- -	- -	21 53	C D
14. Skyway / SR 99 SB Ramps	Signalized	AM PM	11 14	B B	13 15	B B
15. Skyway / SR 99 NB Ramps	Signalized	AM PM	6 11	A B	8 12	A B
16. Skyway / Notre Dame Blvd.	Signalized	AM PM	23 30	C C	23 29	C C
17A. Skyway / Forest Ave.	SSSC	AM PM	3 (>200) 15 (>200)	A (F) C (F)	10 (>200) **55 (>200)**	B (F) **F (F)**
17B. Skyway / Forest Ave.	Signalized	AM PM	-	-	13 10	B A

18. Skyway / Bruce Rd.	Signalized	AM PM	17 21	B C	23 27	C C
19. Bruce Rd. / Webster Dr.	Signalized	AM PM	-	-	7 7	A A

Notes: LOS = Level of Service. SSSC = Side-Street Stop-Controlled. **Bold** indicates unacceptable LOS.

[1]For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For SSSC intersections, the LOS and control delay for the worst movement is shown in parentheses next to the average intersection LOS and delay. Impacts to intersections are determined based on the overall LOS and average delay. Intersection LOS and delay is calculated based on the procedures and methodology contained in the HCM 2010 (TRB, 2010).

[2]Intersection 7 – E 20th Street / Notre Dame Blvd. was upgraded to a signalized traffic control in December 2017. See row 7B for anticipated delay and LOS associated with the current intersection configuration.

[3]Intersection 8 – E 20th Street / Bruce Road is proposed to be a roundabout on the tentative map, however, preliminary research for the Bruce Road Widening Project indicates that a two-lane roundabout would not be adequate for that intersection. Rows 8B and 8C reflect two options for upgrading the intersection by widening the approaches and adding turn lanes.

Source: Fehr & Peers, 2017

As shown in Table IV.O-12, all but three of the study intersections would continue to operate at acceptable LOS thresholds during the weekday AM and PM peak hours under Existing Plus Project conditions.

The intersection at E 20th Street / Notre Dame Boulevard (Intersection 7) was upgraded with a traffic signal in December 2017, during preparation of this DEIR. The projected LOS at this intersection under the Existing Plus Project conditions is acceptable, as indicated on row 7B of Table IV.O-12, above.

Full build-out of the proposed project would result in LOS F conditions during the AM and PM peak hours at Bruce Road / Raley Boulevard (Intersection 13). The project would add an eastern leg to the existing side street stop controlled intersection, serving mostly the medical/dental office land use (Lot 472). The high amount of project traffic to and from Raley Boulevard would face significant vehicle delay on the minor street approach, and would worsen the overall operations of the intersection from acceptable LOS A to unacceptable LOS F under both AM and PM peak hours. As provided in the cumulative impacts analysis below, this intersection is anticipated to operate acceptably (LOS E) as a stop-controlled intersection under future cumulative conditions without the project, therefore traffic from the proposed project creates the need to add capacity at the intersection that would not otherwise be needed to accommodate general growth. This intersection is not currently included in the City's Development Impact Fee (Nexus) Program, therefore upgrading to a signal in conjunction with development of the project is necessary to avoid creating an unacceptable LOS at this location. Although the project is responsible for causing the need to upgrade the intersection to a signal control, there may be other properties that benefit from such an improvement and the developer that installs the traffic signal may qualify for a partial reimbursement from such benefitting properties as set forth by section 3.84 the Chico Municipal Code. With signalization, the intersections would operate at acceptable LOS C under the AM peak hour, and acceptable LOS D under the PM peak hour, as indicated in row 13B of Table IV.O-12, above.

Full build-out of the proposed project would result in LOS F conditions during the PM peak hour at Skyway / Forest Avenue (Intersection 17). The project would mostly add trips to the major street (Skyway) due to development of medical/dental office uses on Lot 472, making it more

difficult for drivers on the minor stop controlled streets (Forest Avenue/Zanella Way) to enter the intersection. The delay for the overall intersection, mostly due to an increase in delay for the side street stop movements, would worsen from acceptable LOS C to unacceptable LOS F. This intersection is currently included in the City's Development Impact Fee (Nexus) Program, however the City's Capital Improvement project to upgrade to a signal at this location is not anticipated to occur within the near-term future scenario analyzed in this section. Since development of Lot 472 may likely precede the City's project to signalize this intersection upgrading to a signal in conjunction with development of Lot 472 is necessary to avoid creating an unacceptable LOS at this location.

Due to the increase in delay from acceptable to unacceptable conditions at Bruce Road / Raley Boulevard and Skyway / Forest Avenue (Intersections 13 and 17), the project would result in a ***significant*** impact to intersection operations.

Mitigation Measure TRANSPORTATION-1: Install a Traffic Signal at Bruce Road / Raley Boulevard (Intersection 13)

The AM and PM peak hour traffic volumes at this intersection were analyzed to determine if a traffic signal would be warranted. According to the California Manual on Uniform Traffic Control Devices (MUTCD), Caltrans 2014, the projected traffic volumes at full project build-out would meet Signal Warrant 3 – Peak Hour Warrant for the AM and PM peak hours. With the implementation of a traffic signal the weekday AM peak hour level of service would improve from LOS F to LOS C, and the PM peak hour level of service would improve from LOS F to LOS D, which would result in a ***less-than-significant*** impact after mitigation.

The applicant shall design, fund, and install a traffic signal when signal warrants are met. The City shall be responsible for monitoring traffic conditions at the intersection and notifying the applicant, in writing, when traffic signal installation is required. Following such notification from the City that the traffic signal is required, the signal shall be included on any subsequent subdivision improvement plans for the project, and no new building permits for traffic-generating uses shall be issued on Lot 472 until the signal has been installed or progress toward installation is substantially underway. To the extent that the applicant qualifies for reimbursement for a portion of the costs associated with this improvement pursuant to provisions of the Chico Municipal Code, the applicant may pursue a Memorandum of Reimbursable Street Facility Costs with the City.

Mitigation Measure TRANSPORTATION-2: Install a Traffic Signal at Skyway / Forest Avenue (Intersection 17)

The PM peak hour traffic volumes at this intersection were analyzed to determine if a traffic signal would be warranted. According to the California Manual on Uniform Traffic Control Devices (MUTCD), Caltrans 2014, the projected traffic volumes meet Signal Warrant 3 – Peak Hour Warrant for the PM peak hour. With the implementation of a traffic signal the weekday PM peak hour level of service would improve from LOS F to LOS A, which would result in a ***less-than-significant*** impact.

The applicant shall design, fund, and install a traffic signal when signal warrants are met. The City shall be responsible for monitoring traffic conditions at the intersection and notifying the applicant, in writing, when traffic signal installation is required. Following such notification from the City that the traffic signal is required, the signal shall be included on any subsequent subdivision improvement plans for the project, and no new building permits for traffic-generating uses shall be issued on Lot 472 until the signal has been installed or progress toward installation is substantially underway. To the extent that the applicant qualifies for reimbursement for the costs associated with this improvement pursuant to provisions of the Chico Municipal Code, the applicant may pursue a Memorandum of Reimbursable Street Facility Costs with the City.

Impact TRANSPORTATION-2: Freeway Operations

Figure IV.O-10 displays the AM and PM peak hour freeway volumes under Existing Plus Project. Table IV.O-13 shows the freeway operations under Existing Plus Project.

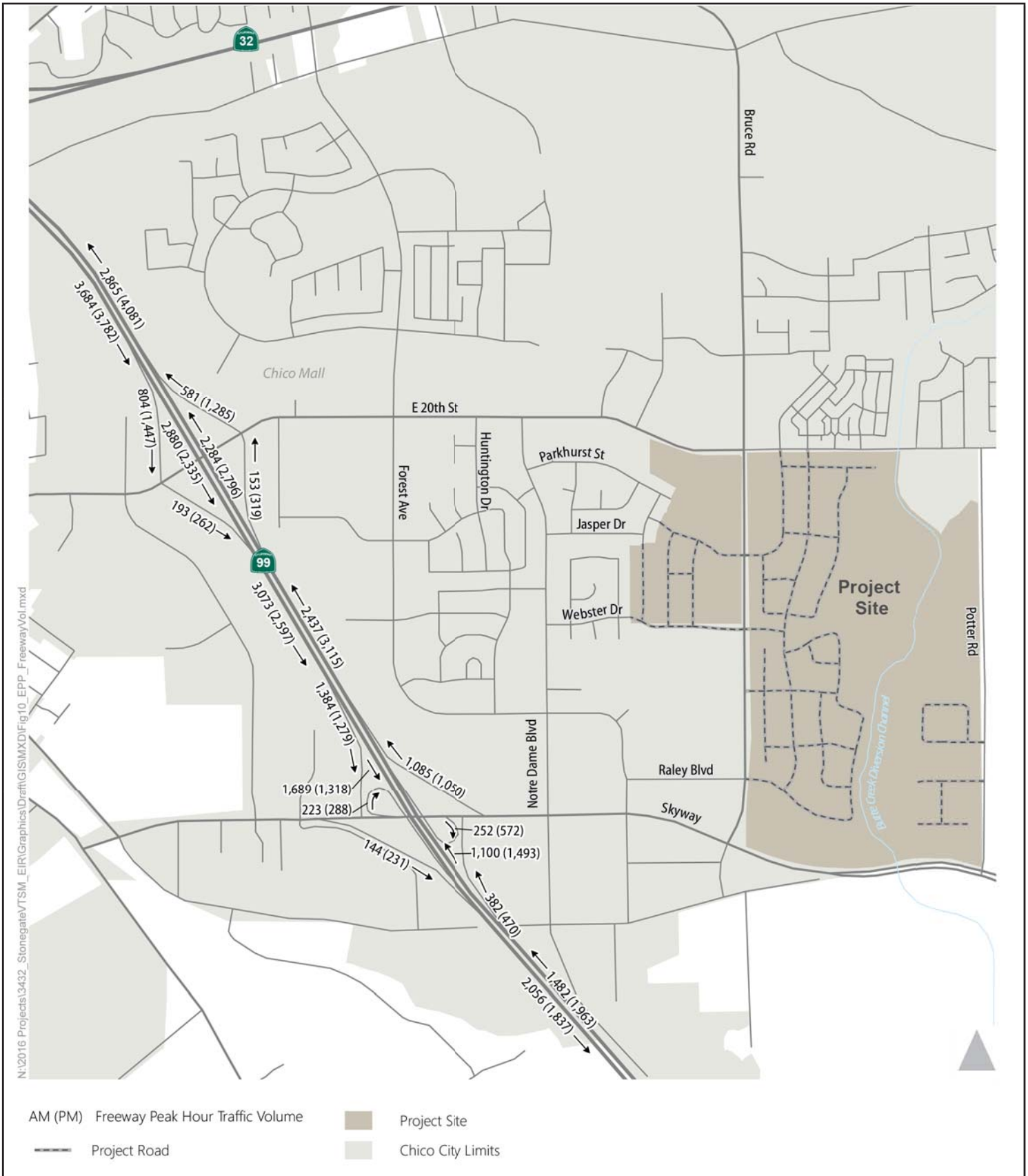


Figure IV.O-10 Existing Plus Project Freeway Volumes

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Date: 3/28/18
Source: Fehr & Peers

Table IV.O-13
Freeway Operations – Existing Plus Project

Freeway	Segment	Segment Type	Peak Hour	Existing Conditions		Existing Plus Project	
				Density[1]	LOS	Density[1]	LOS
State Route 99 Northbound	South of Skyway	Basic	AM PM	13.8 17.4	B B	14.2 17.5	B B
	Skyway Off-Ramp	Diverge	AM PM	18.8 22.8	B C	19.2 22.9	B C
	Skyway	Basic	AM PM	10.5 13.4	A B	10.5 13.3	A B
	Skyway Loop On-Ramp	Merge	AM PM	16.8 21.8	B C	16.8 21.9	B C
	Skyway Slip On-Ramp	Merge	AM PM	25.7 29.9	C D	25.9 30.2	C D
	Skyway to E 20th Street	Basic	AM PM	23.1 27.1	C D	23.4 27.6	C D
	E 20th Street Off-Ramp	Diverge	AM PM	29.1 31.8	D D	29.4 32.2	D D
	E 20th St	Basic	AM PM	21.6 22.8	C C	21.9 23.2	C C
	E 20th Street On-Ramp	Merge	AM PM	30.9 36.3	D E	31.7 37.0	D E
	North of E 20th Street	Basic	AM PM	27.3 37.7	D E	28.3 39.2	D E
State Route 99 Southbound	North of E 20th Street	Basic	AM PM	38.2 37.0	E E	38.9 38.4	E E
	E 20th Street Off-Ramp	Diverge	AM PM	40.6 39.9	E E	41.0 40.7	E E
	E 20th Street	Basic	AM PM	26.7 20.4	D C	26.9 20.6	D C
	E 20th Street On-Ramp	Merge	AM PM	31.5 25.7	D C	31.6 25.9	D C
	E 20th Street to Skyway	Basic	AM PM	29.5 23.0	D C	29.7 23.2	D C
	Skyway Off-Ramp	Diverge	AM PM	35.3 29.3	E D	35.5 29.6	E D
	Skyway	Basic	AM PM	15.8 11.9	B B	15.8 11.9	B B
	Skyway Loop On-Ramp	Merge	AM PM	20.7 16.9	C B	21.0 17.3	C B
	Skyway On-Ramp	Merge	AM PM	22.1 19.1	C B	22.4 19.5	C B
	South of Skyway	Basic	AM PM	19.0 16.2	C B	19.2 16.6	C B

Notes:
[1] Density expressed in passenger car equivalents per hour per mile per lane.
Source: Fehr & Peers, 2017

As shown all freeway mainline segments and ramp merge and diverge segments operate at acceptable LOS E or better under Existing Plus Project. Table IV.O-14 shows the freeway off-ramp queuing under existing plus project. As shown, all queues remain within the available storage with the inclusion of the project.

Table IV.O-14
Freeway Off-Ramp Queueing – Existing Plus Project

Facility	Storage Length (feet)	Peak Hour	Existing Conditions	Existing Plus Project
			Queue (feet)	Queue (feet)
SR 99 Southbound Off-Ramp at E. 20th St	1,350	AM PM	175 300	200 325
SR 99 Northbound Off-Ramp at E. 20th St	1,350	AM PM	125 175	100 200
SR 99 Southbound Off-Ramp at Skyway Rd	1,500	AM PM	250 275	225 575
SR 99 Northbound Off-Ramp at Skyway Rd	1,275	AM PM	150 200	150 225

Notes: Average maximum queue is calculated using an average of 10 SimTraffic runs. Storage length is measured using aerial imagery.
Source: Fehr & Peers 2017

Due to the freeway mainline, merge, diverge, and off-ramp queuing operating acceptably, the project would create a ***less-than-significant*** impact to freeway operations.

Impact TRANSPORTATION -3: Bicycle Facilities

The project would include Class II bike lanes on Bruce Road between E 20th Street and Skyway. The project would also connect to existing bike lanes on Bruce Road, E 20th Street, and Skyway.

The southeast portion of the project site that contains 45 suburban-residential lots (RS-20 lots) would be served by an existing class I bike path along Potter Road; however, no direct bike connection would be available from the residential units to the existing nearby commercial land uses west along Skyway. There currently are no bike lanes present on Skyway that provide continuity between Bruce Road and Potter Road, and none are proposed along this section as part of the project to serve the new homes planned for the RS-20 lots. Placing new housing along Potter Road without a bicycle connection to the nearby commercial uses located on Skyway to the west would substantially increase potential hazards for future residents, as the future residents may attempt to travel the shortest route to the nearest store via bicycle. Further, not including adequate bicycle and pedestrian facilities along this project frontage is inconsistent with several General Plan Policies and Actions that direct incorporation of multi-modal facilities into project designs (CIRC-2.1, CIRC-2.1.3, CIRC-2.2.1, CIRC-3.3 and CIRC-4.2). Since the project does not provide adequate bicycle access for the RS-20 lots, this is considered a ***significant*** impact.

Mitigation Measure TRANSPORTATION-3: Add Bike Lanes or Path Along Skyway

Subdivision improvement plans for the RS-20 lots located along Potter Road (Phases 11 and/or 12), shall include the provision of bike lanes or path connection along Skyway between Potter Road and existing facilities near Bruce Road. Since the existing Skyway bridge crossing over the Butte Creek Diversion Channel is too narrow to accommodate any additional bicycle or pedestrian facilities, a new bridge crossing will be needed to fulfill this mitigation. Any additional public right-of-way needed to accommodate this connection shall be dedicated by the developer. Final design details for the connection required by this mitigation shall be subject to review and approval by the Public Works Director.

Implementation of this bicycle facility would provide adequate bicycle access for the RS-20 lots; therefore, this impact would be reduced to a ***less-than-significant*** level.

Impact TRANSPORTATION-4: Pedestrian Facilities

The project would include sidewalks along all project roadways, including Bruce Road between E 20th Street and Skyway, and on the south side of E 20th Street west of Bruce Road.

The southeast portion of the project site serving the RS-20 lots would be served by an existing path along Potter Road; however, no direct pedestrian facility would be available to the commercial land uses west along Skyway. There is no sidewalk connection present on Skyway between Bruce Road and Potter Road, and none is proposed along this section as part of the project to serve the new homes planned for the RS-20 lots. Placing new housing along Potter Road without a pedestrian connection to the nearby commercial uses located on Skyway to the west would substantially increase potential hazards for future residents, as the future residents may attempt to walk the shortest route to the nearest store. Further, not including adequate bicycle and pedestrian facilities along this project frontage is inconsistent with several General Plan Policies and Actions that direct incorporation of multi-modal facilities into project designs (CIRC-2.1, CIRC-2.1.3, CIRC-2.2.1, CIRC-3.3 and CIRC-4.2). Therefore, because the project does not provide adequate pedestrian access for the RS-20 lots, this is considered a ***significant*** impact.

Mitigation Measure TRANSPORTATION-4: Add Sidewalk or Path Along Skyway

Subdivision improvement plans for the RS-20 lots located along Potter Road (Phases 11 and/or 12), shall include the provision of sidewalk or path connection along Skyway between Potter Road and facilities located near Bruce Road. Since the existing Skyway bridge crossing over the Butte Creek Diversion Channel is too narrow to accommodate any additional bicycle or pedestrian facilities, a new bridge crossing will be needed to fulfill this mitigation. Any additional public right-of-way needed to accommodate this connection shall be dedicated by the developer. Final design details for the connection required by this mitigation shall be subject to review and approval by the Public Works Director.

Implementation of this pedestrian facility would provide adequate pedestrian access for the RS-20 lots; therefore, this impact would be reduced to a ***less-than-significant*** level.

Impact TRANSPORTATION-5: Transit Facilities

Approximately 90 percent of the project's residential land use is within ½ mile of an existing bus stop and transit route, the upper limit for a reasonable walk to access transit service. No new transit routes or bus stops are specifically identified within the project description. The *BCAG Transit and Non-Motorized Plan* identifies Bruce Road between SR 32 and Skyway as a corridor for potential future transit service in conjunction with surrounding peripheral development. Considering that the project does not include any new transit service or bus stops along Bruce Road between E 20th Street and Skyway through the project site, or on Skyway near Potter Road serving the southeast portion of the project, a portion of the project site would not have adequate access to transit service. Therefore, this would be a ***potentially significant*** impact.

Mitigation Measure TRANSPORTATION-5: Transit Stops and Routes

Prior to City approval of each set of detailed subdivision improvement plans, the applicant shall coordinate with local public transit providers to determine a suitable transit service concept for the project site that does not substantially alter existing public transit operations and is consistent with relevant service standards and new service warrants. Potential transit service modifications include a new route or route extension along Bruce Road between E 20th Street and Skyway (consistent with the BCAG Transit and Non-Motorized Plan) and the installation of bus stops internal to the project site. Bus stops should be installed at locations within close proximity to key pedestrian routes (e.g. the Bruce Road / Webster Drive and Skyway / Potter Road intersections). Implementation of this mitigation measure would provide adequate access to transit service, therefore, this impact would be reduced to a ***less-than-significant*** level.

CUMULATIVE IMPACTS

The Cumulative scenario is the analysis scenario in which traffic impacts are analyzed assuming the development of numerous reasonable and foreseeable land uses expected in 2035. This analysis utilizes the 2010 BCAG travel demand model, developed as part of the 2012 BCAG MTP/SCS, to establish future land use and traffic assumptions for 2035. While a City of Chico travel demand model is available, the BCAG travel demand model was utilized for this study because it includes more recent existing and future land use and roadway network within the City of Chico and throughout the BCAG region. To ensure that the BCAG model was sensitive and accurate for this application, it was tested and validated against benchmarks specified by the modeling guidelines contained in the 2010 California Regional Transportation Plan Guidelines (CTC, 2010) and the Travel Model Validation and Reasonable Checking Manual, Second Edition (FHWA, 2010). For cumulative conditions, year 2035 land used inputs were updated to incorporate new development projects that may have been omitted from the original version of the BCAG travel demand model.

Cumulative No Project conditions assume no development or transportation modifications associated with the Stonegate Vesting Subdivision Map project. The Cumulative Plus Project scenario is the analysis scenario in which transportation impacts associated with the proposed project are analyzed in comparison to the Cumulative No Project scenario. Project-related impacts with potential to occur under the Cumulative Plus Project scenario are presented at the end of this section.

Cumulative Roadway and Intersection Improvements

Roadway and intersection improvement projects assumed to be completed under Cumulative conditions are presented below. These include future local roadways as identified in the *City of Chico General Plan*, as well as future freeway improvements identified in the *Transportation Corridor Concept Report, State Route 99* and *Transportation Corridor Concept Report, State Route 32.*

- Auxiliary lanes in both directions on SR 99 between Skyway and E 20th Street
- Auxiliary lanes in both directions on SR 99 between E 20th Street and SR 32
- SR 32 widening to four lanes between Fir St and Yosemite Drive
- E 20th St widening to four lanes between Huntington Drive and Bruce Road
- Extension of Notre Dame Boulevard from E 20th Street to Hartford Drive
- Bruce Rd widening to four lanes between SR 32 and Skyway, including a 2-lane roundabout (as proposed on the tentative map) or improved signalized intersection (as anticipated by the City's Bruce Road Widening Project) at E 20th Street
- New traffic signal at E 20th St / Notre Dame Boulevard
- New traffic signal at Skyway / Potter Road

Cumulative Land Use Developments

Notable land use developments in the vicinity of the project site assumed to be developed under cumulative conditions include the following:

- Meriam Park (mixed-use subdivision northwest corner of E 20th Street and Bruce Road)
- Belvedere Heights (build-out of residential subdivision north of E 20th Street to the west of Bruce Road)
- Special Planning Area 5 – Doe Mill / Honey Run (mostly residential development, some commercial land use, to the east of Potter Road between E 20th Street and Skyway)
- Canyon View High School (northwest corner of Bruce Road and Raley Boulevard)

Traffic Forecasts

A traffic forecasting procedure known as the "difference method" was used to develop cumulative background forecasts. The procedure adds the growth in traffic between the base and future year traffic models to the existing traffic volume. This process accounts for inaccuracies in the base year model, which if not accounted for, would carry forward into the future year model.

The expected distribution of vehicle trips to and from the project under cumulative conditions is shown in Figure IV.O-11. The trip distribution was developed based on the following data sources:

- Complementary land uses (i.e., employment, retail, and schools) within the study area.
- A 'project-only' traffic assignment from the cumulative year BCAG regional travel model.

The cumulative year version of the BCAG regional travel model was updated to incorporate the project roadway network and land uses. The model was refined to match the external trip generation presented in Table IV.O-10. Considering the size of the project's commercial land uses being complementary to nearby residential, and the new connection of project roadways to and from the adjacent neighborhood, the regional travel model was used for both adding the external project vehicle trips onto the roadway network and to account for changes in background travel patterns.

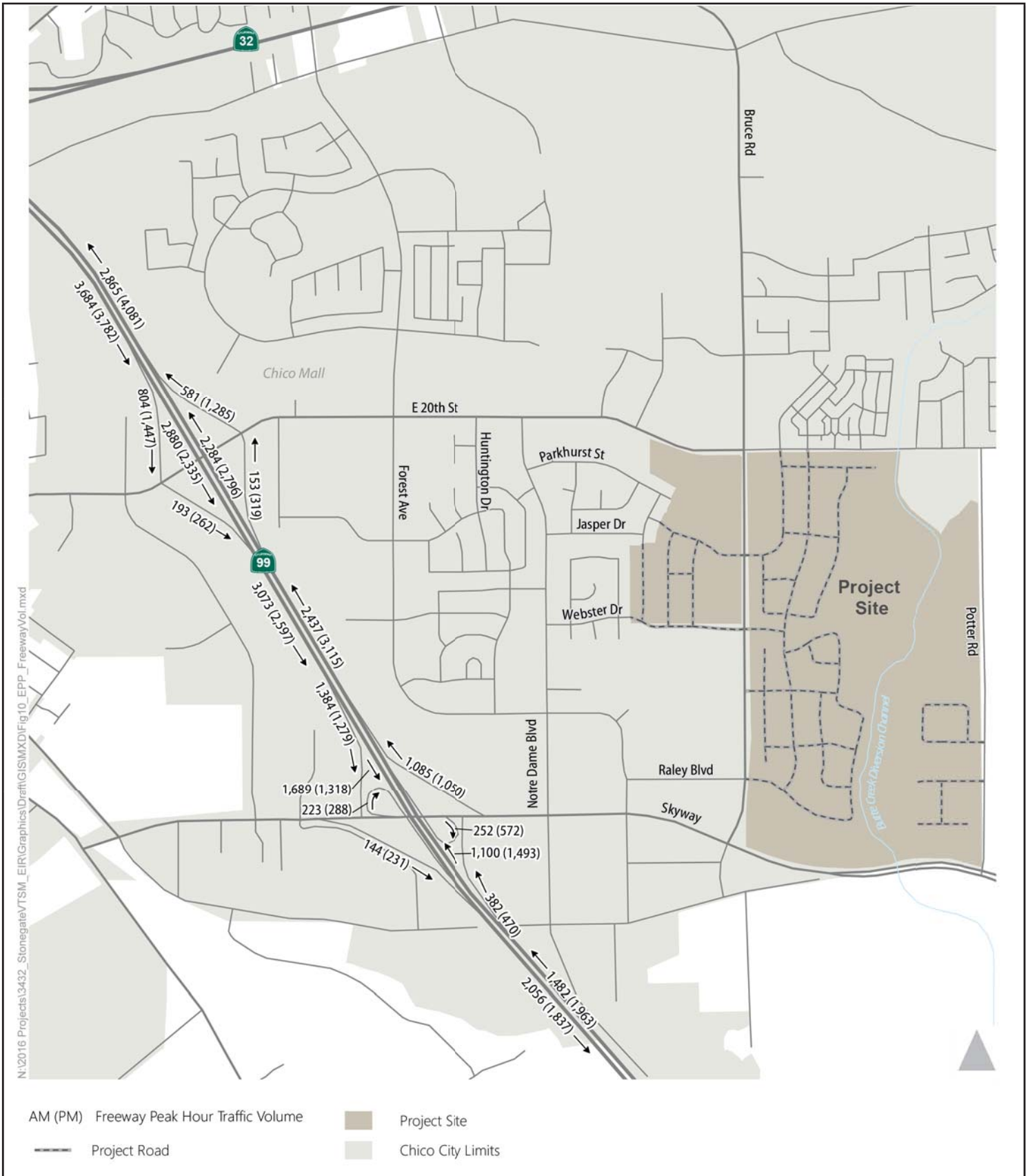

Figure IV.O-11 Project Trip Distribution - Cumulative Plus Project

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Date: 3/28/18
Source: Fehr & Peers

Cumulative Impacts and Mitigation Measures

Potential impacts of the proposed project upon the cumulative transportation system are evaluated based on the thresholds of significance and analysis results. Each project impact is followed by a recommended mitigation measure to reduce the significance of the identified impact, if needed.

Impact TRANSPORTATION-7: Cumulative Intersection Operations

Figure IV.O-12 displays the peak hour intersection traffic volumes under Cumulative No Project conditions. Cumulative Plus Project intersection traffic volumes account for the addition of vehicle trips associated with the project and the redistribution of background traffic. Figure IV.13 displays the traffic volumes under Cumulative Plus Project conditions.

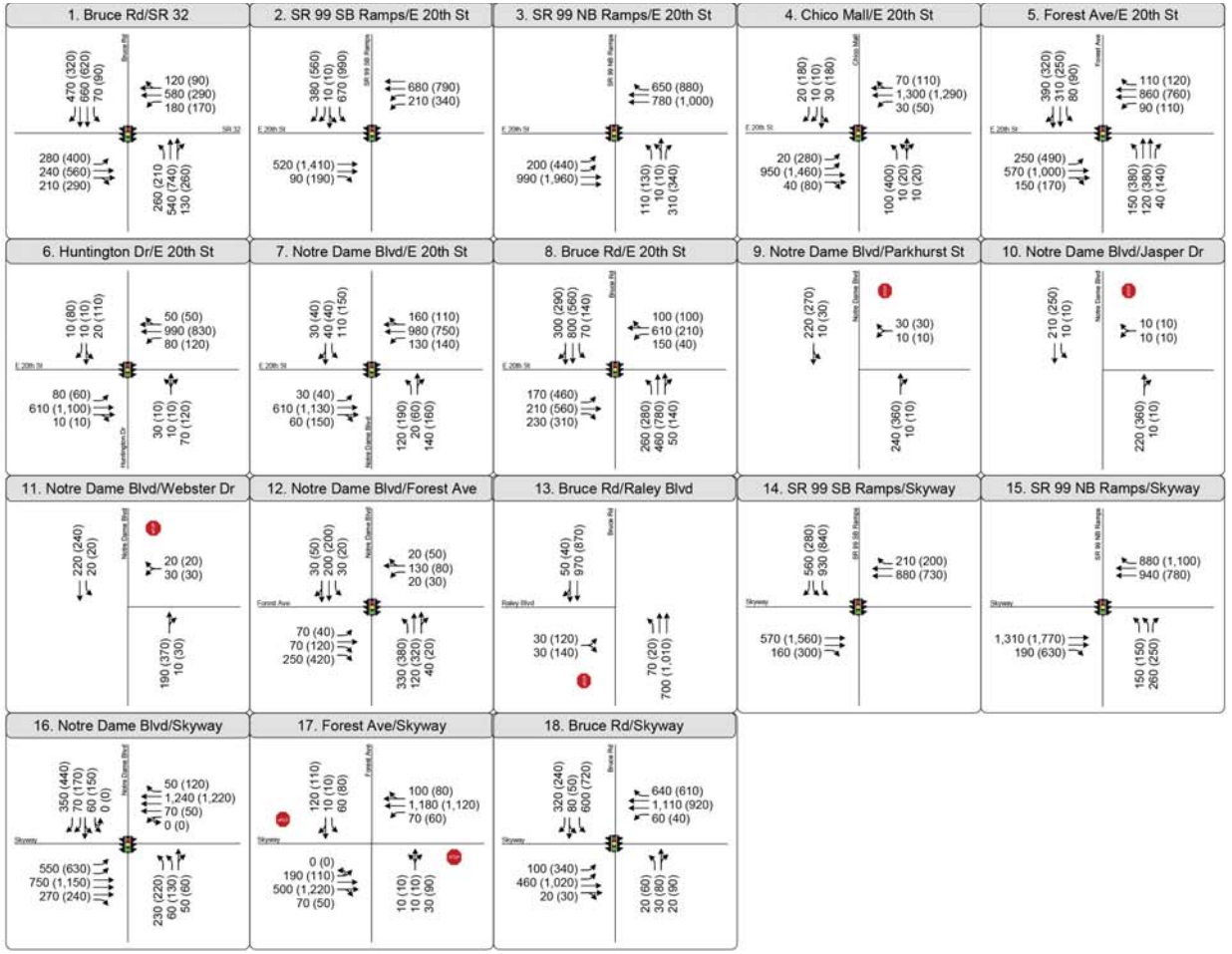

Figure IV.O-12 Peak Hour Traffic Volumes and Lane Configurations - Cumulative No Project

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Date: 3/28/18
Source: Fehr & Peers

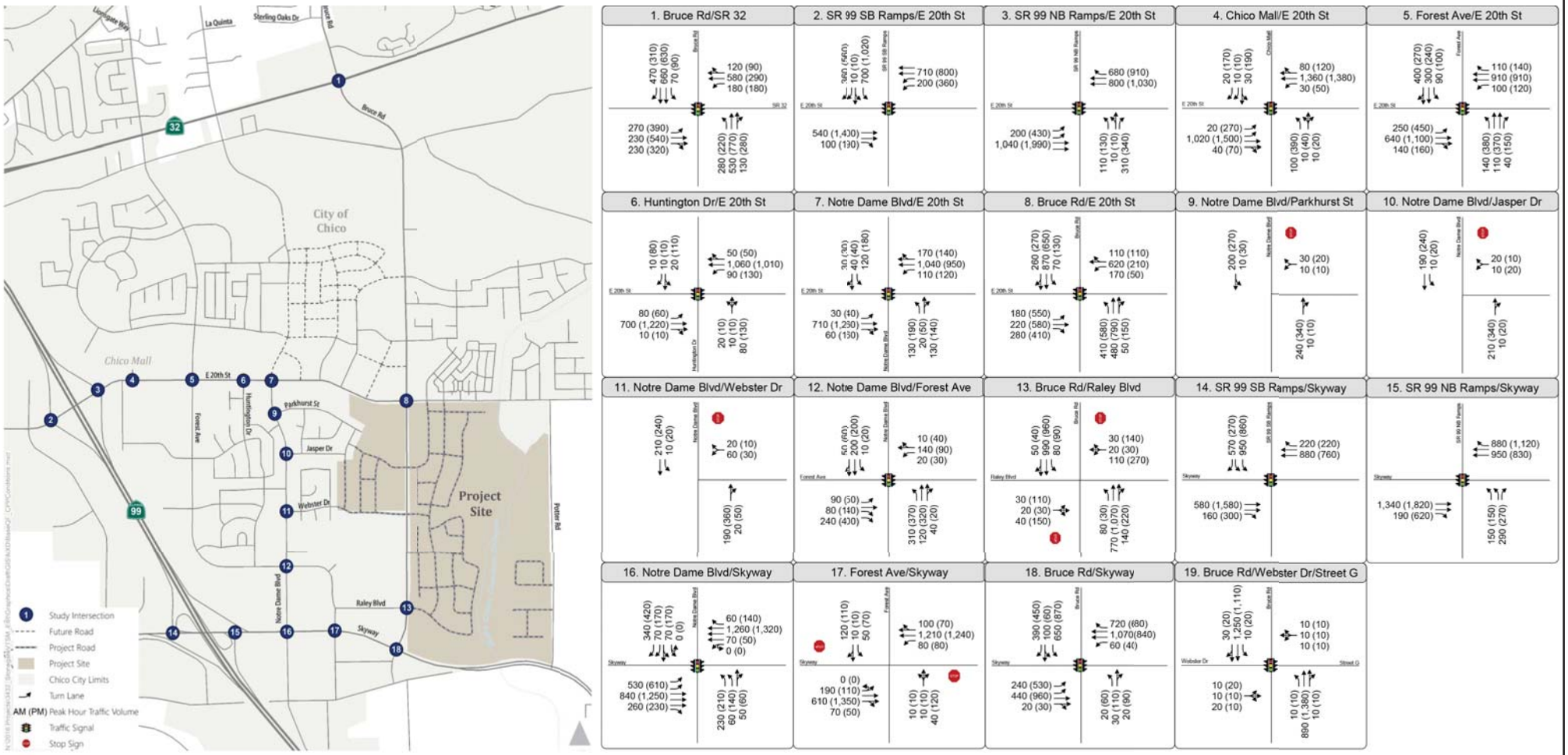

Figure IV.O-13 Peak Hour Traffic Volumes and Lane Configurations - Cumulative Plus Project

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Date: 3/28/18
Source: Fehr & Peers

Table IV.O-15. shows the intersection operations under Cumulative No Project and Cumulative Plus Project conditions.

Table IV.O-15
Intersection Operations – Cumulative Plus Project

Intersection	Traffic Control	Peak Hour	Cumulative No Project		Cumulative Plus Project	
			Delay[1]	LOS	Delay[1]	LOS
1. SR 32 / Bruce Rd.	Signalized	AM	**57**	**E**	**59**	**E**
		PM	44	D	46	D
2. E 20th St. / SR 99 SB Ramps	Signalized	AM	11	B	12	B
		PM	39	D	42	D
3. E 20th St. / SR 99 NB Ramps	Signalized	AM	18	B	19	B
		PM	26	C	27	C
4. E 20th St. / Chico Mall	Signalized	AM	13	B	14	B
		PM	53	D	67	E
5. E 20th St. / Forest Ave.	Signalized	AM	43	D	43	D
		PM	72	E	75	E
6. E 20th St. / Huntington Drive	Signalized	AM	9	A	9	A
		PM	10	A	10	B
7. E 20th St. / Notre Dame Blvd.	Signalized	AM	17	B	18	B
		PM	22	C	24	C
8A. E 20th St. / Bruce Rd.	Signalized	AM	**141**	**F**	**184**	**F**
		PM	71	E	**132**	**F**
8B. E 20th St. / Bruce Rd.	Signalized (upgraded)[2]	AM	66	E	**91**	**F**
		PM	37	D	47	D
8C. E 20th St. / Bruce Rd.	Signalized (upgraded)	AM	35	C	45	D
		PM	36	D	46	D
9. Notre Dame Blvd. / Parkhurst St.	SSSC	AM	1 (11)	A (B)	1 (11)	A (B)
		PM	1 (11)	A (B)	1 (11)	A (B)
10. Notre Dame Blvd. / Jasper Drive	SSSC	AM	1 (11)	A (B)	1 (10)	A (B)
		PM	1 (12)	A (B)	1 (12)	A (B)
11. Notre Dame Blvd. / Webster Drive	SSSC	AM	1 (11)	A (B)	2 (12)	A (B)
		PM	1 (12)	A (B)	1 (12)	A (B)
12. Notre Dame Blvd. / Forest Ave.	Signalized	AM	18	B	28	C
		PM	16	B	17	B
13A. Bruce Rd. / Raley Blvd.	SSSC	AM	3 (82)	A (F)	**>200 (>200)**	**F (F)**
		PM	35 (>200)	E (F)	**>200 (>200)**	**F (F)**
13B. Bruce Rd. / Raley Blvd.	Signalized	AM	-	-	19	B
		PM			69	E
14. Skyway / SR 99 SB Ramps	Signalized	AM	13	B	13	B
		PM	13	B	14	B
15. Skyway / SR 99 NB Ramps	Signalized	AM	8	A	9	A
		PM	8	A	9	A
16. Skyway / Notre Dame Blvd.	Signalized	AM	27	C	26	C
		PM	30	C	32	C

17A. Skyway / Forest Ave.	SSSC	AM PM	**>200 (>200)** **>200 (>200)**	**F (F)** **F (F)**	**>200 (>200)** **>200 (>200)**	**F (F)** **F (F)**
17B. Skyway / Forest Ave.	Signalized	AM PM	17 12	B B	17 15	B B
18. Skyway / Bruce Rd.	Signalized	AM PM	30 41	C D	42 51	D D
19. Bruce Rd. / Webster Dr.	Signalized	AM PM	-	-	7 7	A A

Notes: LOS = Level of Service. SSSC = Side-Street Stop-Controlled. **Bold** indicates unacceptable LOS.

[1]For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For SSSC intersections, the LOS and control delay for the worst movement is shown in parentheses next to the average intersection LOS and delay. Impacts to intersections are determined based on the overall LOS and average delay. Intersection LOS and delay is calculated based on the procedures and methodology contained in the HCM 2010 (TRB, 2010).

[2] Intersection 8 – E 20th Street / Bruce Road is proposed to be a two-lane roundabout on the tentative map, however, preliminary research for the Bruce Road Widening Project indicates that a two-lane roundabout would not be adequate for that intersection. Row 8B and 8C reflect the intersection remaining signalized under future conditions, though with widened approaches and reconfigured turn lanes.

Source: Fehr & Peers, 2017

As shown in Table IV.O-15, all but four study intersections would continue to operate at acceptable LOS thresholds during the weekday AM and PM peak hours under Cumulative Plus Project.

Operations at SR 32 / Bruce Road (Intersection 1) are expected to worsen to unacceptable LOS E under Cumulative Plus Project conditions, with project-generated traffic increasing the average vehicle delay by 2 seconds during the AM peak hour. Although the project would add additional traffic at this intersection, the added delay would be less than 5 seconds during both AM and PM peak hours; therefore the project's impact to this intersection is considered less than significant.

Operations at E 20th Street / Bruce Road (Intersection 8) are expected to worsen under Cumulative No Project conditions due to the increase in traffic on Bruce Road associated with the widening to four lanes, and the addition of traffic on E 20th associated with nearby residential developments. The addition of project traffic at this intersection under Cumulative Plus Project would worsen vehicle delay from unacceptable conditions by more than 5 seconds under AM peak hour, and from acceptable LOS E to unacceptable LOS F under PM peak hour. This intersection is currently included in the City's Nexus program as part of the Bruce Road Widening Project, thus it is anticipated that the intersection will be signalized in the future as a City capital improvement project. Development impact fees paid by the developer of the Stonegate project represent the project's fair share toward funding citywide capital improvement projects needed to address cumulative traffic volumes, including this intersection. The development impact fee program is currently (2018) being addressed by the Chico City Council to ensure that adequate fees amounts are collected for these future community-serving projects. Since this intersection is adjacent to the project site, dedication of the necessary right-of-way and possible interim or full intersection improvements will be required in conjunction with development of project phases. To the extent that the applicant qualifies for reimbursement for the costs associated with this improvement pursuant to provisions of the Chico Municipal Code, the applicant may pursue a Memorandum of Reimbursable Street Facility Costs with the City.

The proposed project would result in LOS F conditions during the AM and PM peak hours at Bruce Road / Raley Boulevard (Intersection 13) under Cumulative Plus Project conditions. The project would add an eastern leg to the existing side street stop controlled intersection, serving mostly the medical/dental office land use on proposed Lot 472. The high amount of project traffic to and from Raley Boulevard would face significant vehicle delay on the minor street approach, and would worsen the overall operations of the intersection from acceptable LOS A to unacceptable LOS F under the AM peak hour, and from acceptable LOS E to unacceptable LOS F under the PM peak hour. Signalization of this intersection is not currently included in the City's Nexus program, therefore upgrading to a signal in conjunction with development of the project is necessary to avoid creating an unacceptable LOS at this location. Although the project is responsible for causing the need to upgrade the intersection to a signal control, there may be other properties that benefit from such an improvement and the developer that installs the traffic signal may qualify for a partial reimbursement from such benefitting properties as set forth by section 3.84 the Chico Municipal Code.

If left as a stop-controlled intersection, the proposed project would worsen unacceptable LOS F conditions during the AM and PM peak hours at Skyway / Forest Avenue (Intersection 17) under Cumulative Plus Project conditions. The project would mostly add trips to the major street (Skyway), making it more difficult for drivers on the minor stop controlled streets (Forest Avenue/Zanella Way) from entering the intersection. The delay for the overall intersection, mostly due to an increase in delay for the side street stop movements, would increase by more than 5 seconds under both AM and PM peak hours. This intersection is currently included in the City's Nexus Program. It is anticipated that the intersection will be signalized in the future either pursuant to *Mitigation Measure TRANSPORTATION-2*, above, or as a City capital improvement project. If constructed by the applicant, to the extent that the applicant qualifies for reimbursement for the costs associated with this improvement pursuant to provisions of the Chico Municipal Code the applicant may pursue a Memorandum of Reimbursable Street Facility Costs with the City

Due to the increase in delay from acceptable to unacceptable conditions at Bruce Road / Raley Boulevard (Intersection 13), or worsening of already-unacceptable delay by more than 5 seconds at Skyway / Forest Avenue (Intersection 17), the project would result in potentially ***significant*** impacts to intersection operations under Cumulative Plus Project conditions.

Mitigation Measure TRANSPORTATION-6: Install a Traffic Signal at Bruce Road / Raley Boulevard (Intersection 13)

The AM and PM peak hour traffic volumes at this intersection were analyzed to determine if a traffic signal would be warranted. According to the California Manual on Uniform Traffic Control Devices (MUTCD), Caltrans 2014, the projected traffic volumes at full project build-out would meet Signal Warrant 3 – Peak Hour Warrant for the AM and PM peak hours. With the implementation of a traffic signal the weekday AM peak hour level of service would improve from LOS F to LOS C, and the PM peak hour level of service would improve from LOS F to LOS E, which would result in a ***less-than-significant*** impact after mitigation.

The applicant shall implement *Mitigation Measure TRANSPORTATION-1*.

Mitigation Measure TRANSPORTATION-7: Install a Traffic Signal at Skyway / Forest (Intersection 17)

AM and PM peak hour traffic volumes at this intersection were analyzed to determine if a traffic signal would be warranted. According to the California Manual on Uniform Traffic Control Devices (MUTCD), Caltrans 2014, the projected traffic volumes meet Signal Warrant 3 – Peak Hour Warrant for both peak hours. With the implementation of a traffic signal the weekday AM and PM peak hour level of service would improve from LOS F to LOS B, which would result in a ***less-than-significant*** impact after mitigation.

The applicant shall implement *Mitigation Measure TRANSPORTATION-2*.

Impact TRANSPORTATION-8: Cumulative Freeway Operations

Figure IV.O-14 displays the peak hour freeway volumes under Cumulative No Project, and Figure IV.O-15 displays the peak hour freeway volumes under Cumulative Plus Project.

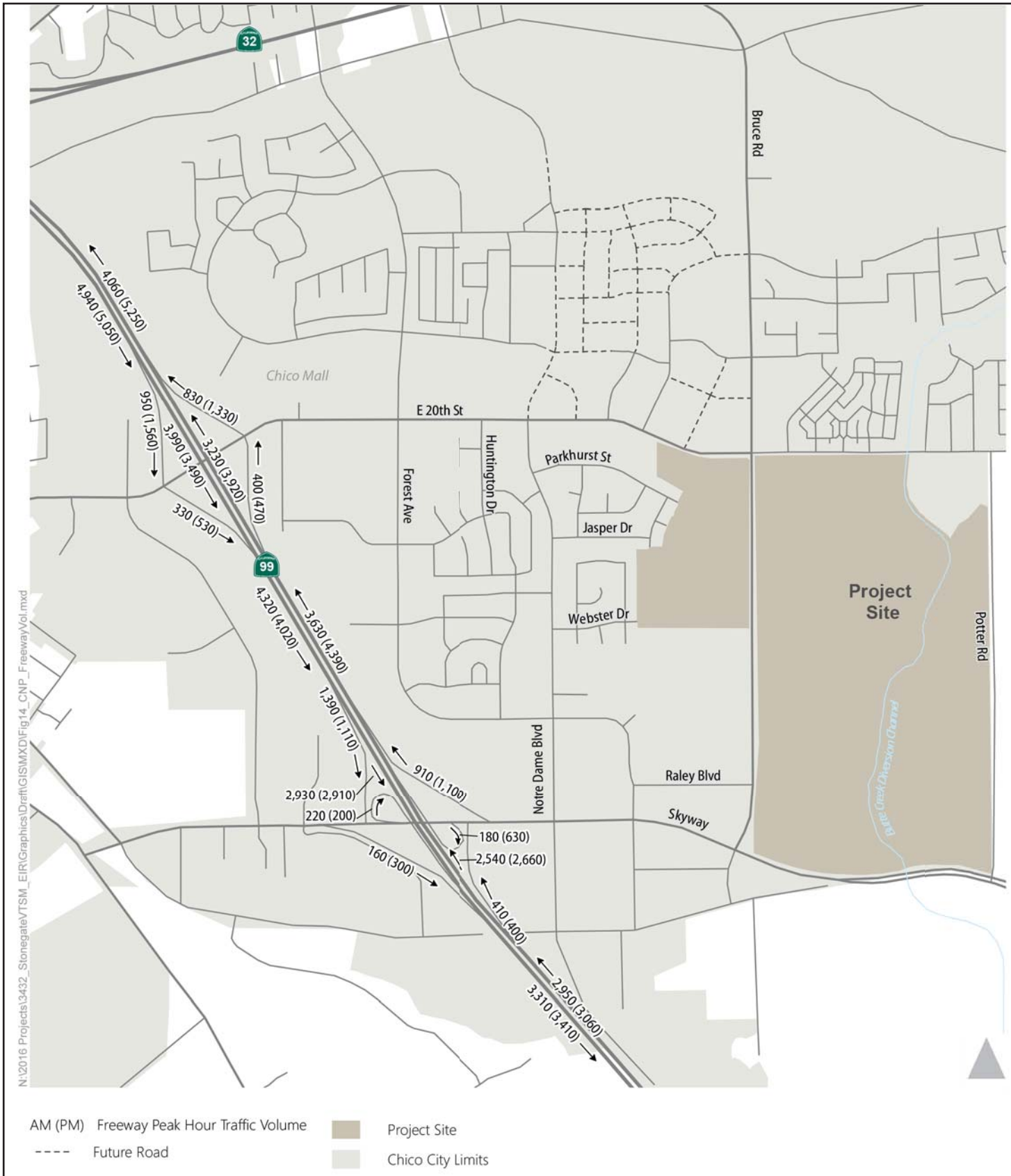

Figure IV.O-14 Cumulative No Project Freeway Volumes

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Date: 3/28/18
Source: Fehr & Peers

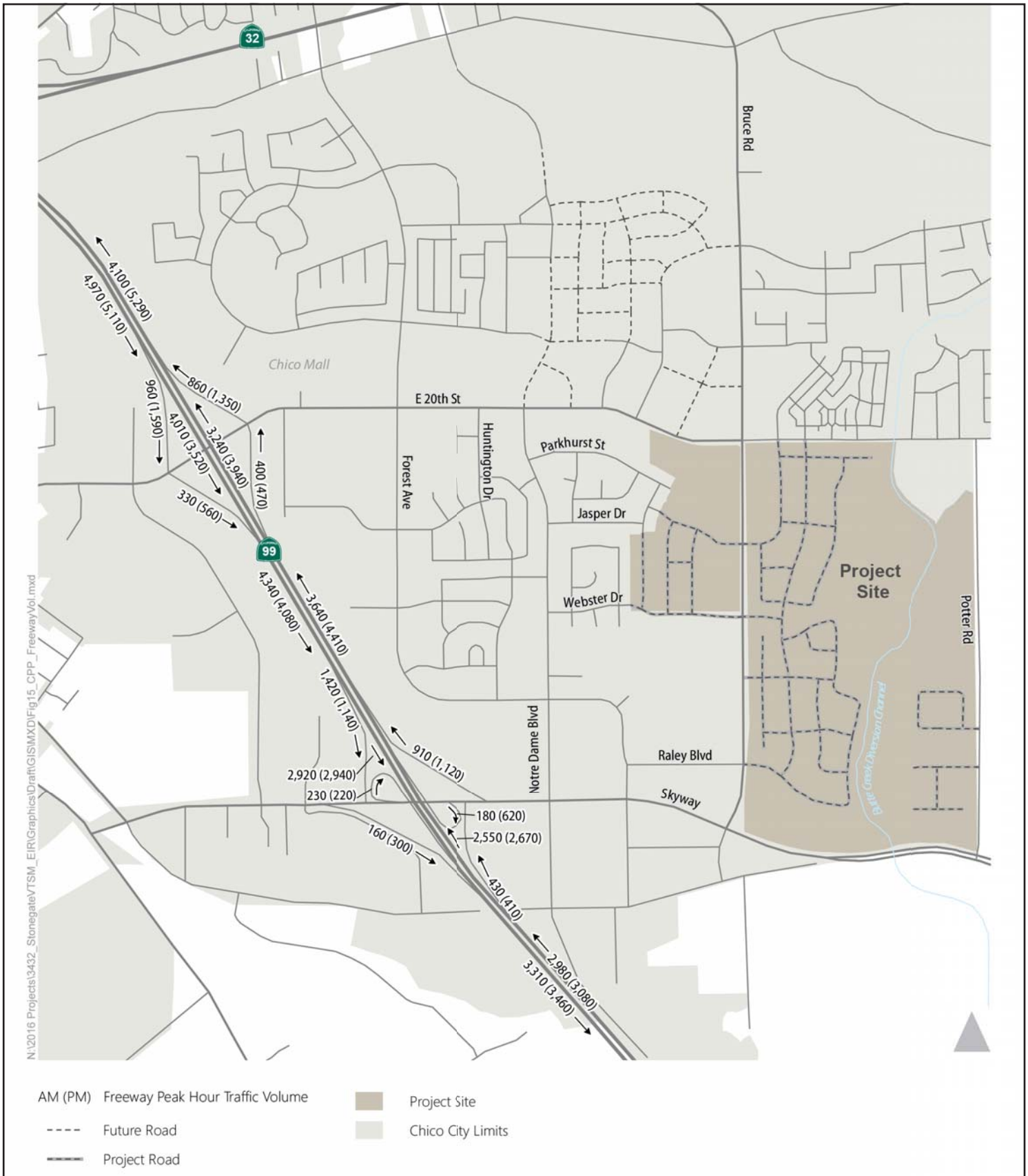

Figure IV.O-15 Cumulative Plus Project Freeway Volumes

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Date: 3/28/18
Source: Fehr & Peers

Table IV.O-16 shows the freeway operations under Cumulative No and Plus Project.

Table IV.O-16
Freeway Operations – Cumulative Plus Project

Freeway	Segment	Segment Type	Peak Hour	Cumulative No Project		Cumulative Plus Project	
				Density[1]	LOS	Density[1]	LOS
State Route 99 Northbound	South of Skyway	Basic	AM PM	26.5 27.8	D D	26.9 28.0	D D
	Skyway Off-Ramp	Diverge	AM PM	32.5 33.6	D D	32.8 33.8	D D
	Skyway	Basic	AM PM	22.4 23.6	C C	22.5 23.7	C C
	Skyway Loop On-Ramp	Merge	AM PM	28.2 32.7	D D	28.3 32.7	D D
	Skyway Slip On-Ramp to E 20th Street Off-Ramp	Weave	AM PM	- -	C D	- -	D D
	E 20th Street	Basic	AM PM	29.9 36.4	D E	30.0 36.8	D E
	E 20th Street On-Ramp to SR 32 Off-Ramp	Weave	AM PM	- -	D E	- -	D E
State Route 99 Southbound	SR 32 On-Ramp to E 20th Street Off-Ramp	Weave	AM PM	- -	E F	- -	E F
	E 20th Street	Basic	AM PM	42.6 33.5	E D	43.0 33.9	E D
	E 20th Street On-Ramp to Skyway Off-Ramp	Weave	AM PM	- -	E D	- -	E D
	Skyway	Basic	AM PM	26.3 26.1	D D	26.2 26.4	D D
	Skyway Loop On-Ramp	Merge	AM PM	31.2 30.6	D D	31.2 31.0	D D
	Skyway Slip On-Ramp	Merge	AM PM	32.6 33.2	D D	32.6 33.6	D D
	South of Skyway	Basic	AM PM	30.9 32.3	D D	30.9 33.0	D D

Notes:
[1] Density expressed in passenger car equivalents per hour per mile per lane.
Source: Fehr & Peers, 2017

As shown, all freeway mainline and ramp segments operate at LOS E or better, except for the weave segment on SR 99 Southbound from SR 32 On-Ramp to E 20th Street Off-Ramp, which operates at LOS F under Cumulative No Project and Plus Project conditions. Based on the *Transportation Corridor Concept Report, SR 99*, the concept LOS F is considered acceptable conditions.

Table IV.O-17 shows the freeway off-ramp queuing under Cumulative No and Plus Cumulative Plus Project. As shown, all queues remain within the available storage with the addition of the project.

Table IV.O-17
Freeway Off-Ramp Queueing – Cumulative Plus Project

Facility	Storage Length (feet)	Peak Hour	Cumulative No Project	Cumulative Plus Project
			Queue (feet)	Queue (feet)
SR 99 Southbound Off-Ramp at E. 20th St	1,350	AM PM	250 550	250 400
SR 99 Northbound Off-Ramp at E. 20th St	1,350	AM PM	275 600	225 650
SR 99 Southbound Off-Ramp at Skyway Rd	1,500	AM PM	275 450	300 350
SR 99 Northbound Off-Ramp at Skyway Rd	1,275	AM PM	300 275	225 250

Notes: Average maximum queue is calculated using an average of 10 SimTraffic runs. Storage length is measured using aerial imagery.

Source: Fehr & Peers, 2017

Due to the freeway mainline, merge, diverge, weave, and off-ramp queueing operating acceptably, this would be a ***less-than-significant*** impact.

With regard to cumulative impacts from the project on bicycle facilities, pedestrian facilities and transit facilities, no additional impacts have been identified under cumulative conditions beyond those identified under Impacts Transportation-3 through Transportation-5, above. With implementation of *Mitigation Measures Transportation-3, Transportation-4 and Transportation-5*, cumulative impacts from the project on bicycle facilities, pedestrian facilities and transit facilities would be reduced to a **less-than-significant** level.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

All project impacts related to transportation and traffic are ***less-than-significant*** after implementation *of Mitigation Measures TRANSPORTATION-1* through *TRANSPORTATION-7*.