14

Traffic and Circulation

This chapter provides information on traffic and transportation services in the Project Area. The chapter identifies potential traffic and transportation-related impacts resulting from implementation of the Project, and identifies mitigation measures to avoid and/or reduce impacts that may result from the proposed Project. This chapter of the EIR describes several existing and future scenarios under which the Project's traffic impacts on study area intersections, local roadways and the freeway have been assessed, including:

- Existing conditions;
- Existing plus Project scenario, which presents an evaluation of the potential traffic impacts that would be expected to occur with the addition of Project-generated traffic;
- "Pipeline" scenario, which presents an evaluation of Existing traffic plus "pipeline" projects, defined as other development projects that are presently being constructed, are approved, or are currently pending approval;
- "Pipeline" plus Project scenario, which presents an evaluation of the potential traffic impacts that would be expected to occur with the addition of Project-generated traffic on near term growth;
- Cumulative scenario, which represents traffic operations based on build-out of the City of Petaluma General Plan 2025, including implementation of the Rainier Interchange with U.S. 101 and other planned circulation system improvements identified in the General Plan Mobility chapter; and
- Cumulative plus Project scenario.

Information contained in this chapter of the Draft EIR is derived from the following primary sources:

- *Traffic Impact Study* prepared for the Project by Fehr & Peers in 2008, including updates as of through 2017 (**Appendix 14A and 14B**)
- *Graylawn Roadway Capacity Analysis Memo*, prepared by Fehr & Peer 2016 (**Appendix 14C**)
- *Update of Existing Traffic Volumes and Intersection Operations Memo*, prepared by Fehr & Peer 2016 (**Appendix 14D**)
- Analyses contained in the *City of Petaluma General Plan 2025 Environmental Impact Report* (EIR), certified on May 19, 2008; and
- Analysis contained in the City of Petaluma's *Rainier Cross-Town Connector Draft EIR*, July 2014.

The traffic analysis and supplemental memorandums are included in Appendix 14 to this EIR, on the City of Petaluma website and/or on file for review at the City of Petaluma Planning Division.

Existing Conditions

This section evaluates the operational characteristics of automobile circulation in the Project study area. A key characteristic of automobile circulation in Petaluma is its limited east-west connectors. There are

three major barriers to east-west travel: U.S. 101, the Sonoma Marin-Area Rail Transit (SMART) corridor, and the Petaluma River. Streets that cross these facilities (and particularly those that cross all three, providing continuous travel opportunities between east and west Petaluma) are limited, and generally experience high travel demand.

The existing and future transportation network analyzed in this EIR is comprised of several facility types including roadways, sidewalks, bicycle facilities, and transit routes and stops. The transportation street grid in Petaluma is skewed, such that United States Highway 101 (U.S. 101) runs northwest and southeast, and street grid systems in Petaluma generally follow this orientation. Throughout the transportation section, U.S. 101 and parallel roads are described as north-south facilities. Likewise, facilities perpendicular to U.S. 101 are described as east-west facilities.

Roadway Segments

The Project site is located along the western side of U.S. 101. **Figure 14-1** shows the Project site location, Project study area, and study intersections. The following major roadways provide local and regional vehicular access to the Project site.

U.S. 101

U.S. 101 is a major north-south highway serving the west coast between Los Angeles, California and northern Washington. In the Bay Area, U.S. 101 extends northward from San Francisco and the Golden Gate Bridge as a four- to eight-lane divided freeway through Marin County, reducing to four lanes with alternating freeway and highway segments through northern Marin County and into Sonoma County (in the area frequently called the Novato Narrows), before widening to six lanes with HOV lanes in each direction north of Old Redwood Highway. Plans to widen U.S. 101 to provide high-occupancy vehicle (HOV) lanes in both directions are included as part of the Caltrans Marin-Sonoma Narrows HOV Widening (MSN) Project, component MSN-C, which is a top priority for Tier 1 funding in the Metropolitan Transportation Commission Regional Transportation Plan. At the time that the preparation of this EIR was commenced, the HOV lanes on U.S. 101 had been completed north of Petaluma to Santa Rosa and from Central Marin County through Novato. In addition, during the time of EIR preparation, construction at several interchanges in Petaluma was completed, to close the gap in HOV lanes between Novato and north of Petaluma.

Near the Project site in Petaluma, U.S. 101 is a four-lane freeway. The closest freeway access to the Project site is an interchange at East Washington Street, approximately 0.75 miles due east of the Project site. Interchanges at Lakeville Street (approximately 1.7 miles south of the Project site) and Old Redwood Highway (approximately 2.2 miles northwest of the Project site) also provide access to U.S. 101, while Corona Road (approximately 1.4 miles to the northwest) provides an overcrossing of U.S. 101.

Petaluma Boulevard

Petaluma Boulevard is a north-south roadway that roughly parallels U.S. 101 and provides access through Downtown Petaluma. Petaluma Boulevard connects to U.S. 101 with full interchanges at its southern end (Petaluma Boulevard South) and northern end (Old Redwood Highway). By federal definition, Petaluma Boulevard is Business U.S. 101 (although the roadway is not publicly signed as such). The naming convention of Petaluma Boulevard is “Petaluma Boulevard North” for the segment north of Washington Street, and “Petaluma Boulevard South” for the segment south of Washington Street. The roadway is referred to simply as Petaluma Boulevard in this document (most of the evaluation occurs on Petaluma Boulevard North).

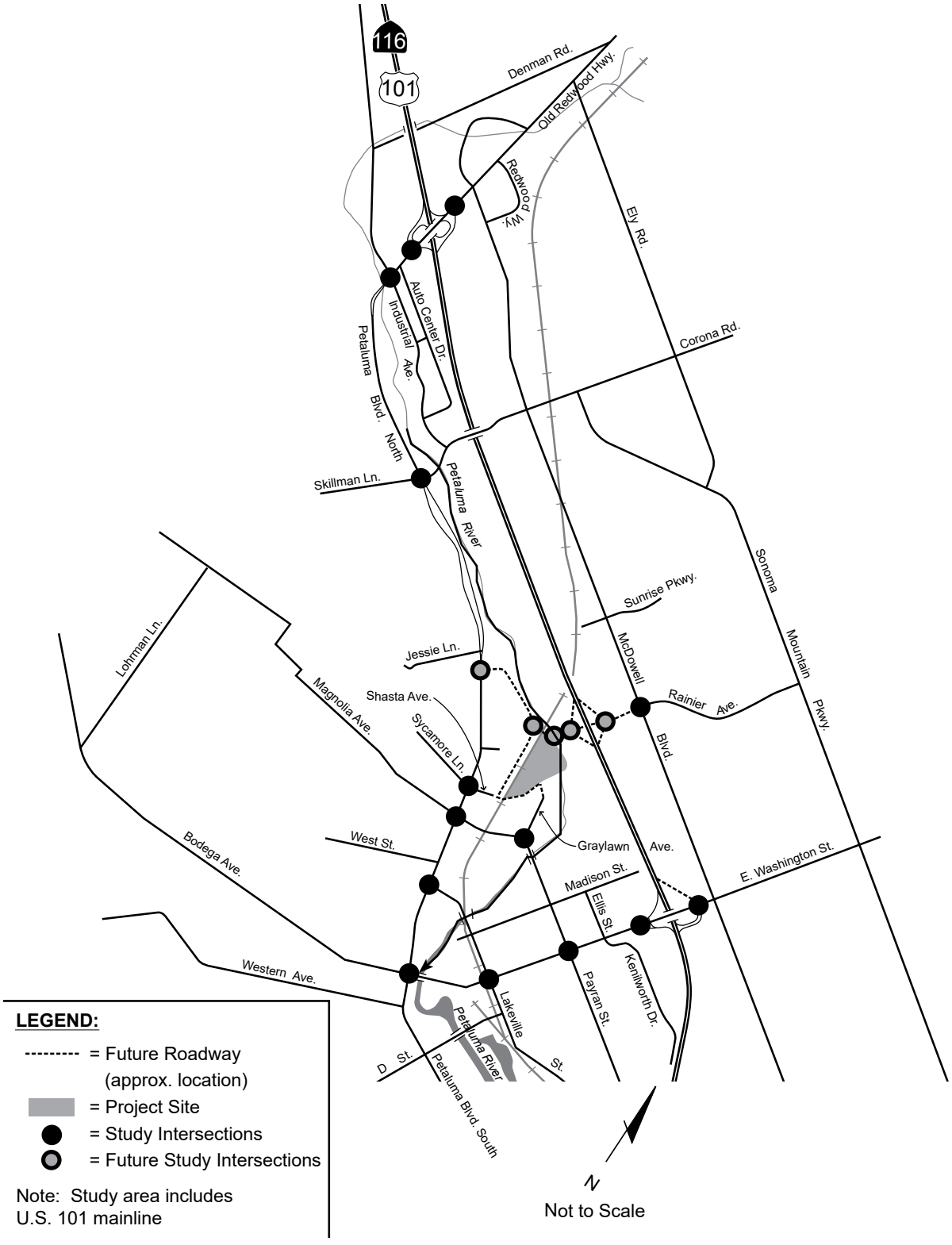

Figure 14-1
Study Area and Study Intersection Locations

Source: Fehr & Peers

Petaluma Boulevard is generally a four-lane roadway that narrows to two-lanes with a two-way left-turn lane between Lakeville Street and E Street in Downtown Petaluma. It is undivided through Downtown Petaluma where sidewalks, frequent crosswalks, and on-street parking are present. At the northern and southern sections, the roadway is divided with intermittent sidewalks and infrequent crosswalks. On-street bicycle lanes exist for only a short segment of the roadway. The speed limit on the roadway varies between 25 and 45 MPH, depending on the area through which it passes.

Near the Project site, Petaluma Boulevard is a four-lane roadway with discontinuous sidewalks, and no on-street parking. North of Shasta Avenue/Sycamore Lane, Petaluma Boulevard has on-street bike lanes and the posted speed limit on the roadway is 35 MPH. South of Shasta Avenue/Sycamore Lane, there are no bike lanes and the posted speed limit is 30 MPH.

Payran Street

Payran Street begins at Caulfield Lane near the U.S. 101/Lakeville Street interchange and continues to Petaluma Boulevard where the roadway continues west as Magnolia Avenue. Payran contains an existing at-grade rail crossing which has been improved to minimal pedestrian standards as part of the SMART commuter rail.

Near the Project site, Payran Street is a two-lane collector roadway providing access to the residential neighborhood through which it passes. Sidewalks and on-street parking exist on the roadway. The roadway is signed as a Class III bike route where bicyclists share the roadway with vehicles. The shared use roadway is emphasized by the frequent "sharrow" striping located in the center of the travel way. A sharrow marking consists of two chevrons atop a bicycle image pointing in the direction of travel. The speed limit on this section of roadway is 25 MPH.

Graylawn Avenue

Graylawn Avenue is a two-lane residential roadway that connects to Payran Street and terminates approximately a quarter mile to the north, on the west side of the Petaluma River. The roadway is used primarily by residents in the neighborhood north of Payran Street. Sidewalks exist on both sides of the roadway adjacent to existing development. There is no striping and no bicycle lanes on the roadway. The residential roadway does not have a posted speed limit; therefore, the prima facie speed limit is 25 MPH.

As a designated Residential roadway,[1] the City of Petaluma Street Standards intends that Graylawn Avenue have less than 2,000 average daily vehicle trips[2]. Graylawn Avenue currently serves approximately 89 single-family homes and the existing 76-unit Oak Creek Apartment complex. A 72-hour roadway count on Graylawn Avenue between Payran Street and Betty Court was collected in November 2015 to determine existing average daily traffic (ADT). The existing two-way ADT for the street section was 954 vehicles per day.[3]

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1 City of Petaluma General Plan; Figure 5-1

2 City of Petaluma. Department of Engineering; Street Design and Construction Standards & Specifications, 1999

3 Fehr & Peers, Graylawn Data Collection Summary and Roadway Capacity Analysis Memo, April 13, 2016 (included in Appendix F)

The portion of Graylawn Avenue that is a single point of access (north of Jess Avenue) is not permitted by Fire Code to serve more than 50 homes without a secondary fire apparatus roadway (Emergency Vehicle Access or street).[4] This portion of Graylawn currently serves one single family home and the existing 76-unit Oak Creek Apartment complex, and thus exceeds the 50-unit threshold. Therefore, any new units will require a secondary fire apparatus roadway such as an EVA or street. The applicant acknowledges this and proposes to construct an EVA to Bernice Court as part of the Project.

Additionally, the project site is currently encumbered by the existing 1982 PUD that restricts access to any new development at the northern majority of the Project site (APN -009) to a new Rainier Avenue extension or other new public street, rather than existing streets such as Graylawn Avenue. The proposed project identifies the extension of Shasta Avenue, as a new at-grade crossing over the SMART corridor, as the primary access point, with Graylawn serving as the second primary access point, and proposes to amend the existing PUD accordingly.

Shasta Avenue

Shasta Avenue is a short roadway segment running between Petaluma Boulevard and the SMART rail tracks; it terminates at the tracks and provides access to a small number of existing residential homes. Near Petaluma Boulevard, Shasta Avenue also provides access to commercial uses along the easterly corners of Petaluma Boulevard, and a rear driveway access to the shopping center to the south along Petaluma Boulevard. For the first approximately 150 feet from Petaluma Boulevard, Shasta Avenue is improved with three travel lanes, including a dedicated outbound left-turn lane onto Petaluma Boulevard, and curb, gutter and sidewalk along both sides of the street. The southerly side of the street, which provides driveway access to the shopping center, is improved with curb, gutter and sidewalk for a length of approximately 275 feet. Beyond that, Shasta Avenue is an unimproved road with no lane markings and no curb, gutter or sidewalk. The speed limit on Shasta Avenue is 25 MPH.

There are currently two separate plans to extend Shasta Avenue beyond its existing eastern terminus. The Petaluma General Plan includes the extension of Shasta Avenue to the proposed Rainier Avenue extension, running north along the western side of the SMART tracks ("Shasta Extension to Rainier")[5]. The Sid Commons Project proposes to extend Shasta Avenue across the SMART tracks to connect to Graylawn Avenue and serve the Project Site ("Shasta Extension to Graylawn")[6].

East Washington Street

East Washington Street is a major east-west trending arterial street serving downtown Petaluma and crossing U.S. 101, the Petaluma River, and the SMART corridor. East Washington Street is the only roadway that provides continuous travel opportunities from the far eastern edge of the City (Adobe Road) to the far western edge of the City, and provides a freeway interchange. The centralized location of the roadway, its regional function carrying traffic west to Bodega Bay and to southwestern portions of Sonoma County, and its transit function (all Petaluma Transit routes travel on Washington Street for portions of their routes) make it the street on which there are the most competing demands. East

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4 City of Petaluma, Fire Department, local amendment to CA Fire Code D106.1: Since at least 2007, has required residential projects with more than 50 dwelling units to be provided with two separate and approved fire apparatus access roads, regardless of whether they are equipped with automatic fire sprinkler systems.

5 City of Petaluma General Plan; Figure 3.2-4

6 The Shasta Extension to Graylawn would require a new crossing of the SMART railroad to access the project site. This crossing depends on the approval from the California Public Utilities Commission.

Washington Street's interchange with U.S. 101 is the nearest interchange to the south of the Project site. High traffic volumes on East Washington Street occur during the PM peak hour near the interchange. This roadway section carries approximately 28,000 vehicles per day. Pedestrian and bicycle facilities are minimal on East Washington Street, with narrow sidewalks and no bicycle lanes. The speed limit on East Washington Street is 30 MPH.

Corona Road

Corona Road is a two-lane east-west trending roadway that crosses the Petaluma River, connecting Petaluma Boulevard to North McDowell Boulevard and Sonoma Mountain Parkway to the east. Corona Road becomes Skillman Lane west of Petaluma Boulevard. Corona Road provides the nearest crossing of U.S. 101 and the Petaluma River to the north of the Project site. However, Corona Road does not have an interchange with U.S. 101. The speed limit on Corona Road is 35 MPH.

Old Redwood Highway

Old Redwood Highway is generally a north-south trending arterial street connecting northern Petaluma with the town of Cotati to the north. Old Redwood Highway becomes Petaluma Boulevard just west of U.S. 101 and runs east and west near the freeway. Within the City limits, Old Redwood Highway provides two lanes in each direction. The speed limit on Old Redwood Highway is 35 MPH.

Rainier Avenue

Rainier Avenue is a four-lane east-west trending street connecting McDowell Boulevard and Sonoma Mountain Parkway to the east. Although the City's General Plan 2025 currently identifies Rainier Avenue as an arterial, it serves primarily as a residential collector street but has been designed to accommodate a larger amount of traffic than it currently experiences. Rainier Avenue currently does not extend west of U.S. 101, although the General Plan identifies the extension of Rainier from its current terminus to Petaluma Boulevard with an interchange at its future U.S. 101 crossing. To this end, in 2015, the City of Petaluma certified the Rainier Cross-Town Connecter EIR (August 2015). The speed limit on Rainier Avenue is 35 MPH.

McDowell Boulevard

McDowell Boulevard is a four-lane arterial that extends north and south along the east side of U.S. 101. McDowell has two travel lanes in each direction and a raised median. South McDowell Boulevard starts at Lakeville Highway and extends north to Washington Street, where it becomes North McDowell Boulevard and extends to Old Redwood Highway. McDowell Boulevard is a designated bicycle route in the City of Petaluma's Bicycle Plan. Bicycle facilities on the McDowell Boulevard corridor frequently change in nature and location. To remain on the designated bicycle facilities on McDowell Boulevard, a cyclist must cross the street as the facility moves from one side to the other and switch from riding in a marked on-street bicycle lane to an off-street multi-use trail several times. The speed limit on McDowell Boulevard is 40 MPH.

Study Intersections

Intersections are generally the critical capacity-controlling elements of the urban and suburban roadway network. Therefore, the operations of critical intersections typically form the most useful indicator of the adequacy of the vehicular circulation system. Fourteen existing intersections near the Project site are most likely to experience increases in traffic due to the proposed project. Figure 14-1 shows the study intersections in relation to the Project site. The existing study intersections are listed as follows:

1. U.S. 101 Northbound Ramps/Old Redwood Highway (Signalized)
2. U.S. 101 Southbound Ramps/Old Redwood Highway (Signalized)
3. Petaluma Boulevard North/Stony Point-Industrial (Signalized)
4. Petaluma Boulevard North/Corona Road (Signalized)
5. Petaluma Boulevard North/Shasta Avenue – Sycamore Lane (Signalized)
6. Petaluma Boulevard North/West Payran Street – Magnolia Avenue (Signalized)
7. Petaluma Boulevard North/Lakeville Street (Signalized)
8. Petaluma Boulevard/Washington Street (Signalized)
9. East Washington Street/Payran Street (Signalized)
10. East Washington Street/US 101 Southbound Ramps (Signalized)
11. East Washington Street/US 101 Northbound Ramps (Signalized)
12. West Payran Street/Graylawn Avenue (Unsignalized)
13. North McDowell Boulevard/Rainier Avenue (Signalized)
14. East Washington Street/Lakeville Street (Signalized)

Intersection Analysis Methodology

Traffic engineers and planners commonly use an operational grading system called level of service (LOS) to measure and describe the operation of the local roadway network. This qualitative grading system is designed to depict traffic flow conditions. The LOS grading system considers traffic flow factors such as speed, travel time, delay, and freedom to maneuver. Six levels of operation or "grades" are typically used, ranging from LOS A, representing the best operating conditions, to LOS F, representing the worst operating conditions. “At capacity” operations are represented by LOS E conditions. When actual volumes exceed intersection design capacity, stop-and-go conditions typically result, and operations are designated as LOS F.

The proper LOS calculation methodology for intersections is dependent on the type of intersection control device – that is, whether the intersection is controlled by a traffic signal, stop signs, or roundabout. The analysis methodology used in this EIR for each intersection type is described below, and is consistent with the City’s Guide for the Preparation of Traffic Impact Studies.[7]

Analysis of Signalized Intersections

The analysis of operations at signalized study intersections in this EIR has been conducted using the methodology described in Chapter 16 of the 2000 Highway Capacity Manual (HCM) from Transportation Research Board. [8]

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[7] Guide for the Preparation of Traffic Impact Studies, City of Petaluma, 2007.

[8] The analysis for this project and its NOP began in 2008, before HCM 2010 was available. The City’s TIS guidelines have not been updated as to require an updated 2010 methodology. It is anticipated that HCM 2000 and 2010 would yield relatively similar results for signalized intersections operating on typical peak hour conditions. HCM 2010 methodology are most different for unsignalized intersections on arterials. The only

This methodology determines the LOS rating based on the average "control delay" experienced at the intersection (in seconds per vehicle). Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration. The average control delay for the signalized study intersections was calculated using the Synchro analysis software and is correlated to LOS designations as summarized in **Table 14-1**.

Table 14-1: Signalized Intersection Level of Service Definitions

Level of Service	Signalized Intersection	Average Control Delay (sec./veh.)
A	No approach phase is fully utilized and no vehicle waits longer than one red indications.	≤ 10
B	An occasional approach phase is fully utilized. Drivers begin to feel restricted.	> 10 – 20
C	Major approach phase may become fully utilized. Most drivers feel somewhat restricted.	> 20 – 35
D	Drivers may wait through no more than one red indication. Queues may develop but dissipate rapidly, without excessive delays.	> 35 – 55
E	Volumes approaching capacity. Vehicles may wait through several signal cycles and long vehicle queues from upstream.	> 55 – 80
F	Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.	> 80

Source: *Highway Capacity Manual*, Transportation Research Board, 2000

Analysis of Unsignalized Intersections

For the unsignalized (stop-controlled) study intersection, LOS calculations have been conducted using the methodology contained in Chapter 17 of the HCM. Like signalized intersections, LOS ratings are based on the "average control delay" expressed in seconds per vehicle. At two-way or side street stop-controlled intersections, the control delay is calculated for each movement, not for the entire intersection. The LOS for the intersection is reported based on the single controlled movement with the highest average control delay. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. **Table 14-2** summarizes the relationship between delay and LOS for unsignalized intersections.

unsignalized intersection in the study area is Graylawn, which operates acceptably and this conclusion is unlikely to substantially change between methods.

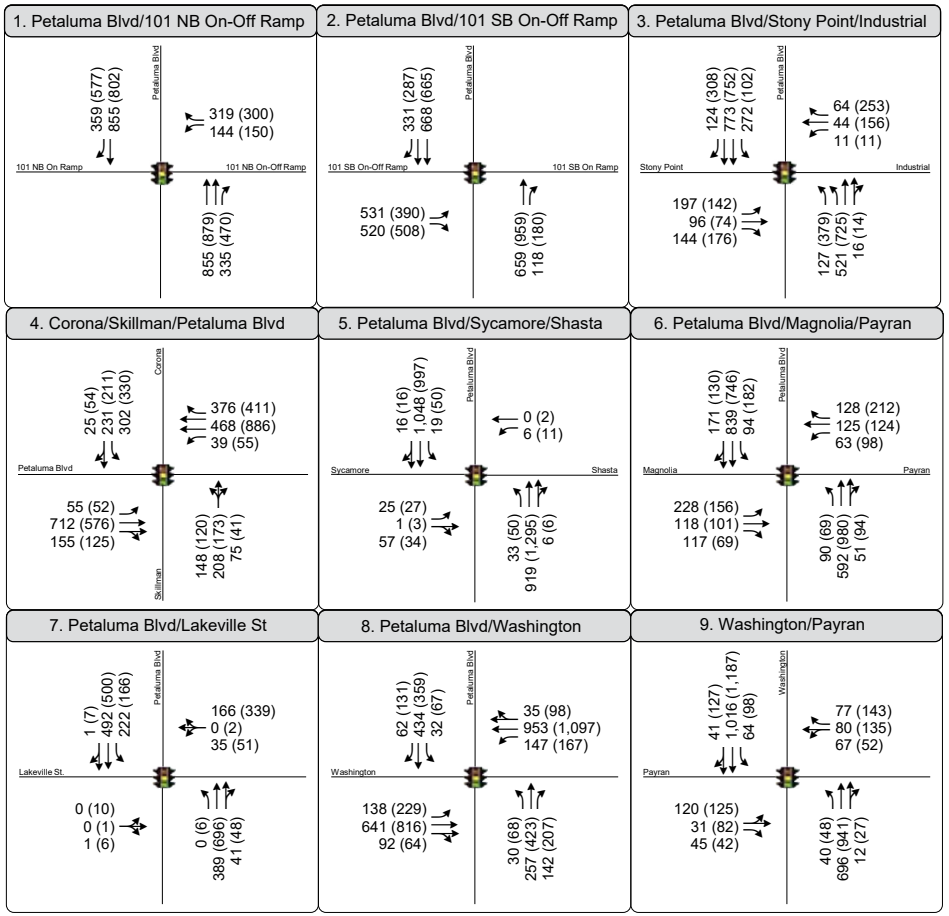
Table 14-2: Unsignalized Intersection Level of Service Definitions

Level of Service	Unsignalized Intersection	Average Control Delay (sec/veh)
A	No delay for stop-controlled approaches.	0 – 10
B	Operations with minor delay.	> 10 – 15
C	Operations with moderate delays.	> 15 – 25
D	Operations with some delays.	>25 – 35
E	Operations with high delays, and long queues.	> 35 – 50
F	Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.	> 50

Source: *Highway Capacity Manual*, Transportation Research Board, 2000

Intersection Data Collection

The original peak period traffic counts were collected at study area intersections in May and October 2007, and in January 2008. Traffic counts were again collected in November 2015 at 13 of the 14 study intersections, and compared against the 2007/2008 intersection volumes. The volume counts for intersection turning movements were taken during typical weekdays while school was in session, and no unusual circumstances were observed during the counts. The typical peak hours for vehicle traffic occur between the 7:00 to 9:00 AM and the 4:00 to 6:00 PM periods. The peak hour traffic counts and lane configurations are summarized on **Figures 14-2A and -2B**, and are documented in **Appendix 14A**.



LEGEND:

--------- = Future Roadway (approx. location)

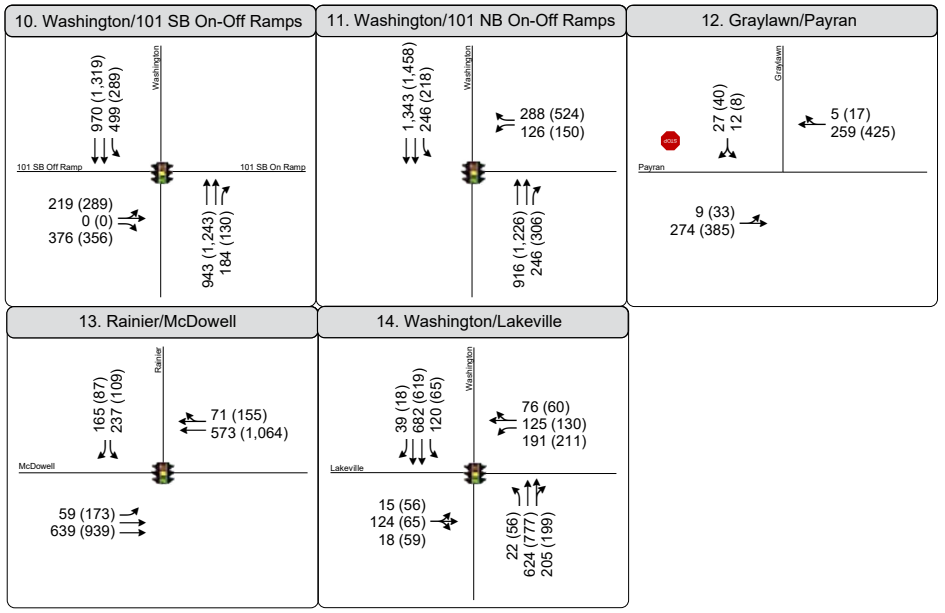
= Project Site

= Study Intersections

= Future Study Intersections

Figure 14-2A
Existing Peak Hour Traffic Volumes and Intersection Lane Configurations

Source: Fehr & Peers



LEGEND:

--------- = Future Roadway (approx. location)

= Project Site

= Study Intersections

= Future Study Intersections

Figure 14-2B
Existing Peak Hour Traffic Volumes and Intersection Lane Configurations

Source: Fehr & Peers

A comparison of the 2007/2008 and the 2015 traffic volumes and the LOS at each of the study intersections is presented in the memorandum "Update of Existing Traffic Volumes and Intersection Operations from 2013 Study" (Fehr & Peers, April 13 2016), which is included in **Appendix 14C**. From this comparison, the 2007/2008 intersection volumes and LOS results were generally higher than the more recent 2015 intersection volumes. While certain transportation network and land use changes have occurred since the 2007/2008 data collection that are not accounted for with the older data, these changes are not anticipated to change the findings of this study based on the assessment presented in this memorandum.[9] Therefore, the 2007/2008 intersection volumes are presented in this analysis as they provide a conservative (or worst-case) basis for analysis of Project impacts. One exception to this approach is the intersection of East Washington Street and Lakeville Street. No counts were taken at this location in 2007/2008, and therefore counts from September 2015 are used in this analysis. These traffic conditions establish the existing baseline against which the proposed Project will be evaluated.

The Pipeline and Cumulative traffic analyses in this report account for any change to traffic conditions that may have occurred since the baseline conditions, due to transportation network changes or economic growth and/or development.

Intersection Operations

The existing intersection control, lane configurations, traffic signal timings, and peak hour traffic volumes were used to analyze the existing conditions LOS at the study intersections in accordance with the methodologies previously described. The results of this analysis are depicted in **Table 14-3**.

The City of Petaluma has set a threshold for acceptable peak hour intersection operations at LOS D or better. As shown in the table, all study intersections operate at LOS D or better during both the AM and PM peak hour under existing conditions. Refer to the Appendix 14A for detailed LOS calculations.

[9] For example, recent changes to the intersection configurations to the following intersections have been completed since 2007/2008: Old Redwood Highway/ US 101 Interchange; East Washington/US 101 Southbound Ramps, East Washington/US 101 Northbound Ramps, and North McDowell Boulevard/Rainier Avenue. While these are not incorporated into the Existing Conditions analysis, as presented in the memorandum "Update of Existing Traffic Volumes and Intersection Operations from 2013 Study" (Fehr & Peers, April 13 2016), the LOS results at these locations did not change significantly between 2007/2008 and 2015. Additionally, these transportation network changes are included in the Pipeline and Cumulative Conditions analysis in order to present the potential impacts associated with the current and future transportation networks.

Table 14-3: Peak Hour Intersection Levels of Service – Existing Conditions

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS	Delay	LOS
1. US 101 Northbound Ramps/Old Redwood Hwy	Signalized	12	B	12	B
2. US 101 Southbound Ramps/Old Redwood Hwy	Signalized	25	C	25	C
3. Petaluma Boulevard North/Stony Point	Signalized	28	C	31	C
4. Petaluma Boulevard North/Corona Road	Signalized	40	D	40	D
5. Petaluma Boulevard North/Shasta Avenue	Signalized	<10	A	<10	A
6. Petaluma Boulevard North/West Payran St.	Signalized	21	C	22	C
7. Petaluma Boulevard North/Lakeville Street	Signalized	11	B	11	B
8. Petaluma Boulevard/Washington Street	Signalized	44	D	23	C
9. East Washington Street/Payran Street	Signalized	17	B	26	C
10. East Washington/US 101 Southbound Ramps	Signalized	40	D	28	C
11. East Washington/US 101 Northbound Ramps	Signalized	14	B	17	B
12. West Payran Street/Graylawn Avenue	Side-St. Stop	12	B	13	B
13. North McDowell Boulevard/Rainier Avenue	Signalized	11	B	10	B
14. East Washington Street/Lakeville Street [2]	Signalized	28	C	33	C

Notes: [1] Average control delay reported in seconds per vehicle for signalized intersections.
Average control, in seconds, of worst-case movement reported for side-street stop controlled intersections.
LOS - level of service

2. Based on September 2015 traffic counts (Fehr & Peers)

Bold = unacceptable intersection operations

All intersections operate acceptably per City LOS standards. Only the intersections of Petaluma Boulevard/Corona Road, Petaluma Boulevard/Washington Street, and East Washington Street/US 101 Southbound Ramps operate at the City's threshold, LOS D conditions. All other study intersections operate at LOS C or better under existing conditions.

Freeway Segments

The following segments of U.S. 101 were identified for evaluation, as these segments are the most likely to receive Project traffic:

- Petaluma Boulevard South to Lakeville Highway (State Route 116);
- Lakeville Highway to Washington Street; and
- Washington Street to Old Redwood Highway

Freeway Analysis Methodology

Freeway segments on U.S. 101 were analyzed using volume-to-capacity (V/C) ratios. The capacities of the study freeway facilities were obtained from the 2000 Highway Capacity Manual (Transportation Research Board 2000). According to the 2000 Highway Capacity Manual, ideal freeway capacity is 2,400 vehicles per hour per lane for a freeway segment with minimum 12-foot travel lane widths, six-foot shoulder widths, two-foot median lateral clearance, a traffic stream composed entirely of passenger cars, interchange spacing greater than two miles, level terrain, and a driver population composed principally of regular users. However, segments of U.S. 101 through Petaluma have some features that reduce the capacity flow rates from the ideal of 2,400 vehicles per hour per lane:

- Heavy vehicles, including trucks, buses, and recreational vehicles, represent approximately five percent of vehicles on U.S. 101;
- Locations with short merge distances for on-ramps; and
- Interchange spacing typically less than two miles.

Per Exhibit 13-3 of the 2000 Highway Capacity Manual, the capacity of a mainline segment with these features would have a capacity of approximately 2,200 vehicles per hour per lane. This capacity is a commonly used estimate of freeway capacity and is consistent with previous analyses performed in Petaluma, including the City of Petaluma 2025 General Plan. Therefore, 2,200 vehicles per hour per lane was selected as an appropriate approximation of freeway capacity through Petaluma.

The policy of Caltrans is to maintain freeway mainline operations at the LOS C/LOS D threshold, based on the Guide for the Preparation of Traffic Impact Studies (Caltrans 2002). However, Caltrans acknowledges that this may not always be feasible. Therefore, if an existing facility operates worse than the appropriate target LOS, the existing service level should be maintained even with the addition of traffic generated by a Project. A summary of the relationship between V/C ratios and LOS for freeway sections is presented in **Table 14-4.**

Table 14-4: Freeway Segment Level of Service Definitions

Level of Service	Traffic Conditions	Upper V/C Threshold
A	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	0.60
B	Free-flow speeds are maintained. The ability to maneuver within the traffic stream is only slightly restricted.	0.70
C	Flow with speeds at or near free-flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	0.80
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably restricted, and the driver experiences reduced physical and psychological comfort.	0.90
E	Operations are at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	1.00
F	Represents a breakdown in flow.	>1.00

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

Freeway Data Collection

Existing freeway traffic volumes were obtained from mainline counts conducted for the *Davidon/Scott Ranch GPA, Rezoning, and VTM Revised Draft EIR* (January 2017) as these volumes were the most recent traffic volumes available at the time of the completion of the traffic analysis. These traffic conditions establish the existing baseline against which the proposed Project is evaluated. The Pipeline and Cumulative Conditions traffic analyses in this report account for any growth in vehicle volumes that may have occurred since the baseline conditions, due to economic growth and/or new development.

Existing Freeway Operations

The existing conditions freeway volumes, theoretical capacity of each segment, resulting V/C ratio, and resulting LOS for the PM peak hour are depicted in **Table 14-5**. The PM peak hour traffic was analyzed (as it is larger than that of the AM peak hour), consistent with previous studies in Petaluma. As shown, northbound U.S. 101 traffic volumes approach the facility's capacity, causing some congestion throughout Petaluma during the PM peak hour, while southbound traffic is relatively uncongested.

Table 14-5: U.S. 101 PM Peak Hour, V/C Ratio and Los Summary
Existing Conditions

Freeway Segment	Direction	Theoretical Capacity[1]	Volume[2]	V/C	LOS
Petaluma Boulevard to Lakeville Highway	NB	4,400	2,987	0.68	B
	SB	4,400	2,023	0.46	A
Lakeville Highway to Washington Street	NB	4,400	3,429	0.78	C
	SB	4,400	2,472	0.56	A
Washington Street to Old Redwood Highway	NB	4,400	3,557	0.81	D
	SB	4,400	2,999	0.68	B

Notes: [1] Per the Petaluma General Plan, this analysis assumes 2,200 vehicles per lane.

[2] Existing volumes from Impact Sciences/Fehr & Peers, *Davidon/Scott Ranch Revised Draft EIR*, March 2017

- **Bold** indicates unacceptable LOS by Caltrans standards.

V/C - vehicle-to-capacity ratio

LOS - level of service

As shown in **Table 14-5**, all freeway segments operate at acceptable LOS D or better during the PM peak hour.

Existing Bicycle and Pedestrian Circulation

A key goal of the Petaluma General Plan is to reduce automobile dependence and enhance "alternative" modes of transportation, such as walking and bicycling. Pedestrian and bicycle access on arterial and collector streets is essential for pedestrians to reach activity centers and transit stops. Although state law permits bicycles on all roads except certain designated freeways and highways, provision of dedicated bicycle facilities is essential to developing a safe and successful bicycle system.

Local Bicycle Facilities

The 2010 American Community Survey indicates that 1.5 percent of workers in Petaluma bicycle to work. This percentage is up from 0.9 percent in 2000 and 1.1 percent in 1990. While this represents only a small portion of the people who bicycle in Petaluma (because it does not measure non-work bicycle trips or irregular work bicycle trips), it is a reasonable comparative statistic to indicate whether bicycling has changed in Petaluma. In fact, while the number of working residents of Petaluma increased by only four percent between 2000 and 2010, the number of people who bicycle to and from work as a primary travel mode increased by over 70 percent. Further, the overall number of bicycle commuters is still relatively low, compared to other modes. With the development of Petaluma's bicycle network, the percentage of residents who bicycle to work will likely continue to grow.

The Petaluma General Plan and Bicycle Master Plan call for development of a comprehensive network of bikeways and bicycle support facilities. Bicycle facilities are classified into three categories:

- Class I – an off-street facility typically referred to as "multi-use trail" or bike path.

- Class II – an on-street bike lane with painted markings and signs designating the lane's bicycle-only use. The bicycle lane is separated from vehicle and pedestrian traffic, but the route may be interrupted by vehicle turning movements at intersections.
- Class III – a bicycle facility designated a route for bicyclists in which the available traveled way is shared with vehicles.

Existing Bike Facilities

Four bicycle facilities currently exist within a quarter mile of the Project site; these are on Payran Street and Petaluma Boulevard and along the Petaluma River and Lynch Creek. **Figure 14-3** illustrates existing and proposed bicycle facilities located in proximity to the Project site.

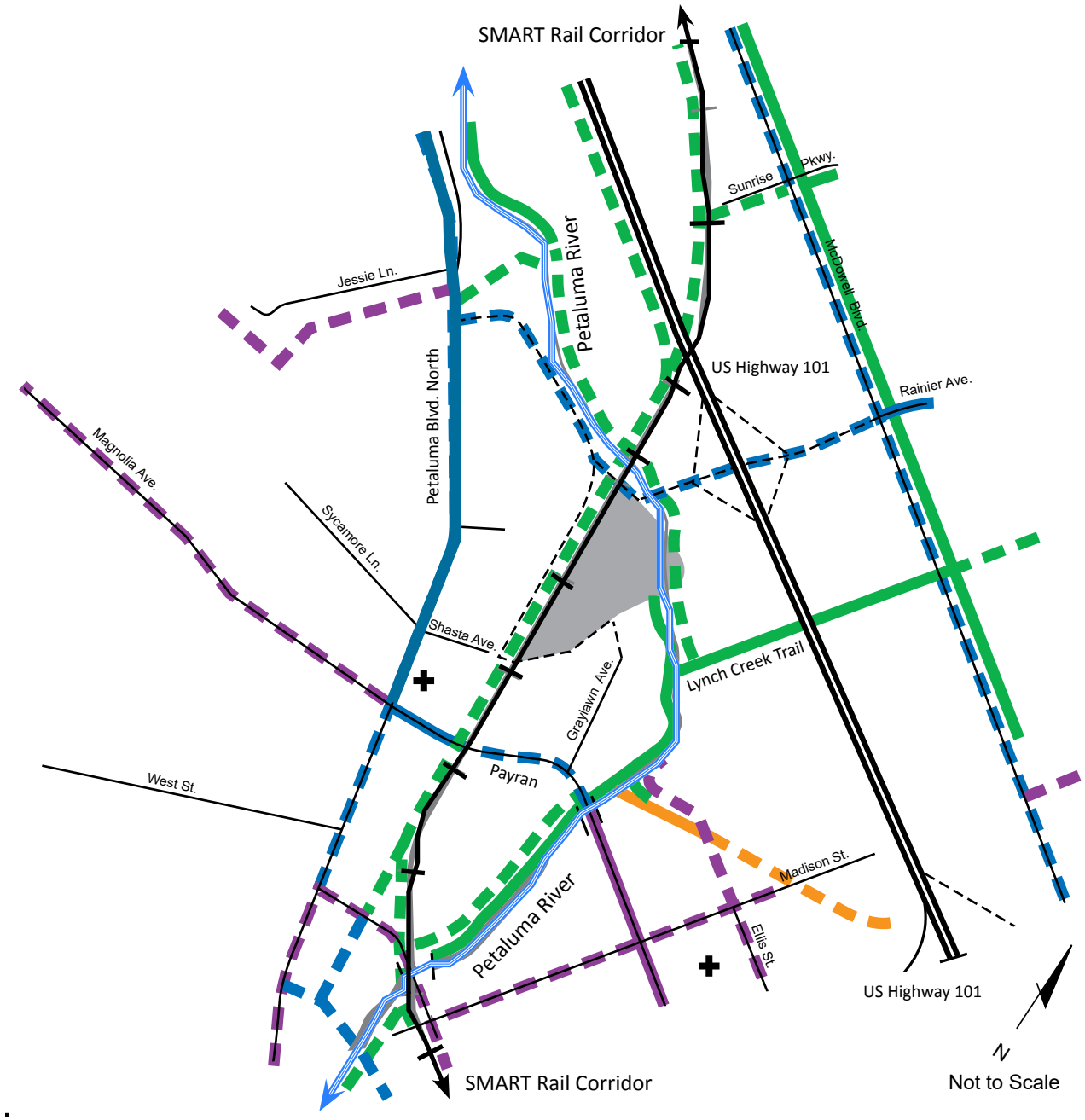
- A Class II bike lane exists for a short segment on Payran Street immediately east of Petaluma Boulevard. The bike lanes exist on both sides of Payran Street for approximately 200 feet between Petaluma Boulevard and the railroad tracks.
- Class II bike lanes on Petaluma Boulevard exist north of Shasta Avenue.
- A Class III bike route on Payran Street exists between the Petaluma River and East Washington Street.
- Class I off-street bike paths exist along the Petaluma River near the Project site. The path along the western bank of the river begins at Payran Street and ends at the Oak Creek Apartments, just south of the Project site. A bike path on the eastern side of the river extends from Lakeville Street and crosses under U.S. 101 where it connects to a path along McDowell Boulevard, and is known as the Lynch Creek Trail.

Local Pedestrian Facilities

The City has established policies to encourage improvement of the pedestrian network. Petaluma has many areas that are especially conducive to walking for enjoyment and as a form of transportation, particularly within the Downtown area and west side neighborhoods that include a grid of streets with a well-developed sidewalk network. The most recent census indicates that 2.6 percent of Petaluma residents walk to and from work. In addition, 3.7 percent of Petaluma residents commute to and from work using public transit. Since most transit trips include a walking trip of some form, the number of residents that walk for a portion of their commute is substantial.

- The proposed Project is an undeveloped parcel in an established residential area. The parcel is bordered by the railroad tracks and the Petaluma River, both barriers for pedestrian travel. Access to the Project site would be provided via Graylawn Avenue and the proposed Shasta Extension to Graylawn at-grade crossing. Additionally, the Project is located adjacent to proposed Class I multi-use trails along the railroad tracks and the river.

Currently sidewalks exist along Graylawn Avenue, providing pedestrian connections to Payran Street and beyond. Sidewalks along Payran Street connect to the Class I multi-use trail on the east side of Petaluma River.



LEGEND:

- ---------- = Future Roadway (approx. location)
- = Project Site
- = Existing Class I - Off Street
- = Proposed Class I - Off Street
- = Existing Class II - On Street, Striped
- = Proposed Class II - On Street, Striped
- = Existing Class III - On Street, Signed
- = Proposed Class III - On Street, Signed
- = Existing Recreational Trail
- = Proposed Recreational Trail
- ✚ = Existing Bike Rack Location

Figure 14-3
Existing and Proposed Bicycle Facilities

Existing Transit Services

Transit service within the study area is provided by Petaluma Transit, Golden Gate Transit, and Sonoma County Transit. Although no service is provided immediately adjacent to the Project site, multiple bus lines travel near the Project, and are described below (**Figure 14-4** displays the bus lines on the roadway network):

Petaluma Transit

- Route 1 & 5 Petaluma Boulevard provides service between Downtown Petaluma and Industrial Avenue with the route terminating near the Industrial/Petaluma intersection along Petaluma Boulevard. Route 1 operates Monday through Saturday with 60-minute headways, while Route 5 only operates during peak commute hours on weekdays.
- Route 2 North McDowell provides service along McDowell Boulevard, originating from the Washington Square Shopping Center and running towards Old Redwood Highway. Route 2 runs on 30-minute headways on weekdays, and operates with 60-minute headways on weekends.
- Route 11 E Washington / Downtown provides service originating from Downtown Petaluma along Washington Street. Route 11 operates on 30-minute headways Monday through Sunday, while running longer hours on weekdays.

Golden Gate Transit

Golden Gate Transit provides inter-county bus service between neighboring counties. The services are separated into "basic" and "commuter" bus routes. Near the Project site, Golden Gate Transit operates the following routes:

- Routes 101 and 101X provide basic bus service throughout the day and evening between San Francisco and Santa Rosa (via Redwood Highway) with a stop at the Copeland Street Transit Mall and along Washington Street at Payran Street (a 20-minute walk to the Project site) in the City of Petaluma.
- Routes 74 provide commute period service between San Francisco and Santa Rosa (via Redwood Highway). Route 74 travels along Petaluma Boulevard with stops near the Project site at the Petaluma/Payran intersection (a 15-minute walk to the Project site). The routes only operate in the morning and afternoon commute period on weekdays.

Sonoma County Transit

- Route 40 provides service between Downtown Petaluma and Sonoma. The route travels along Lakeville Street and terminates at the Petaluma Transit Mall.
- Routes 44/48 provide service between Downtown Petaluma and Santa Rosa. Route 44 travels along McDowell Boulevard and Washington Street. Route 48 travels along Old Redwood Highway and Petaluma Boulevard.

LEGEND:

- ---------- = Future Roadway (approx. location)
- = Project Site
- = Petaluma Transit Route 1 Petaluma Blvd.
- = Petaluma Transit Route 2 North McDowell
- = Golden Gate Transit Route 74
- = Sonoma County Transit Route 44/48
- = Multiple Transit Routes (along US 101)
- = Transit Stops

Figure 14-4
Existing Transit Network

Sonoma-Marin Area Rail Transit District (SMART)

The railroad tracks adjacent to the Project site are currently in operation by the Northwest Pacific Railroad Company, which renewed rail freight service between Lombard/Napa Junction and Windsor, California, after having been fully closed since 1999. Sonoma-Marin Area Rail Transit (SMART) is a passenger train and multi-use pathway project located in San Francisco's North Bay. SMART will share use of the rail tracks with freight services to provide commuter rail service along 70 miles of Railroad alignment, connecting residents of the two counties to destinations along the route. SMART will serve 14 stations from Cloverdale in Sonoma County to the San Francisco-bound ferry terminal in Larkspur, Marin County. Two stations are planned for Petaluma: Downtown (approximately 1.2 miles from Project site) and Corona (approximately 2.5 miles from Project site). Passenger rail service began full passenger train service on August 25, 2017, serving Phase 1 stations between the Sonoma County Airport north of Santa Rosa and San Rafael. SMART also plans to construct a rail-side trail system along the length of the tracks.

Downtown Station

The renovated historic rail depot is SMART's downtown stop in Petaluma. Located adjacent to Lakeville Street and bounded by East Washington Street and D Street, the station provides access to the downtown, the Turning Basin area and the Copeland Street Transit Center. No major park and ride lot is planned for this station site. Over the longer term, SMART has expressed an interest in collaborating with the City of Petaluma in developing property near the Downtown Station as transit-oriented, mixed-use development.[10]

Corona Station

SMART intends to provide a second station in northern Petaluma as part of its second phase. Currently, both the City of Petaluma's planning documents and SMART's planning documents identify Corona Road at North McDowell Boulevard as the optimal location to serve employment, residences, and the Petaluma Campus of the Santa Rosa Junior College. The Corona Station is envisioned to accommodate park and ride facilities, as well as mixed use development.

Planned Transportation Improvements and Projects

Roadways

Several proposed roadway projects in the City of Petaluma were in planning stages, undergoing construction, or have been completed during the preparation of this EIR that could influence traffic circulation within the Project study area. These proposed roadway projects are listed here and described in detail in the applicable sections: [11]

- Rainier Avenue Extension (and Interchange)
- U.S. 101 Marin-Sonoma Narrows Project (U.S. 101 HOV Lanes)

[10] SMART, Petaluma SMART Rail Station Area: TOD Master Plan, page 2-7, 2013

[11] The East Washington Street and Old Redwood Hwy Interchange improvements are not listed here as they were recently completed. They are included in the Pipeline and Cumulative conditions. The remaining above improvements are only included under Cumulative Conditions to reflect the General Plan Buildout.

- Signal synchronization Project

Bicycle Facilities

Several bicycle facilities are planned near the Project site (see Figure 14-3).

- The City Bike Map[12] indicates that a Class I off-street bike path is planned along the westerly side of the Petaluma River, continuing northward (upstream) from its existing terminus at the Oak Creek Apartments. This path is also referred to as the River Trail and is on the Project site.
- A new Class I path along the existing railroad tracks adjacent to the Project site, on the west side of the tracks, is anticipated as a component of the SMART system.
- The City Bike Map shows new/expanded Class II on-street bike lanes on the following roadways near the Project site: Payran Street east of the rail line, Petaluma Boulevard south of Payran, and the Rainier Avenue Extension.

Impact Analysis

Standards of Significance

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Petaluma plans, policies and/or guidelines, and agency and professional standards, the Project's impacts on hydrological resources would be considered significant if it would:

15. Cause an increase in traffic that 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 V/C ratio for freeways, or congestion at intersections);
16. Exceed, either individually or cumulatively, a level of service (LOS) standard established by the county Congestion Management Agency (Sonoma County Transportation Authority) or City of Petaluma for designated roads or highways;
17. 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;
18. Substantially increase hazards due to a design feature (i.e., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
19. Result in inadequate emergency access;
20. Result in inadequate parking capacity; or
21. Conflict with adopted policies, plans, or programs supporting alternative transportation.

The above general significance criteria have been interpreted into the following specific thresholds as described in the City's General Plan 2025:

City Roadway and Intersection Impact Criteria

The City's level of service standard is LOS D. Based on existing CEQA and City of Petaluma standards, traffic impacts are identified as significant if the Project would cause:

[12] City of Petaluma General Plan; Figure 5-2

- Operations (LOS) at a signalized intersection to deteriorate from an acceptable level (LOS D or better) under conditions without the Project to an unacceptable level (LOS E or F);
- For signalized intersections that operate at LOS E under conditions without the Project, the LOS to deteriorate to LOS F;
- For signalized intersections operating at LOS F without the Project, any additional vehicle trips to the intersection;
- For unsignalized intersections operating acceptably (LOS D or better) under conditions without the Project, the LOS to deteriorate to unacceptable (LOS E or F) conditions AND the traffic volumes at the intersection would satisfy the Caltrans peak-hour volume warrant criteria for traffic signal installation; or
- For unsignalized intersections operating at unacceptable levels (LOS E or F) under conditions without the Project, average delay to increase by five or more seconds AND the traffic volumes at the intersection would satisfy the Caltrans peak-hour volume warrant criteria for traffic signal installation.

U.S. 101 Impact Criteria

Significant traffic impacts on freeway segments are identified when a project causes:

- The volume on the freeway segment to exceed its capacity (cause LOS E or better to deteriorate to LOS F); or
- An increase in traffic on a freeway segment already exceeding its capacity by more than one percent of the freeway segment's design capacity.

Emergency Access Impact Criteria

An emergency vehicle access impact is significant if the Project would:

- Provide inadequate design features to accommodate emergency vehicles accessing and circulating within the project site; or
- Cause a substantial decrease in travel speeds on primary emergency response routes such that emergency vehicles would be significantly delayed.

Pedestrian and Bicycle Impact Criteria

Pedestrian and bicycle impacts are considered significant if the Project would:

- Result in unsafe pedestrian and/or bicycle traffic flow patterns;
- Exacerbate a current unsafe pedestrian and/or bicycle condition within the area;
- Restrict or compromise pedestrian and/or bicycle flows within the area;
- Not provide good pedestrian and bicycle linkages internal to the Project and connecting to adjacent facilities;

- Not provide secure and safe bicycle parking in adequate proportion to anticipated demand for bicycle parking;
- Interfere with planned pedestrian and bicycle facilities; or
- Create inconsistencies with adopted pedestrian or bicycle system plans, guidelines, policies, or standards.

Transit Impact Criteria

A transit impact is considered significant if the Project would:

- Result in a significant unanticipated increase in transit patronage beyond the capacity of existing service; or
- Be inaccessible to transit riders (defined as within one-quarter mile of a transit stop).

Transportation/Circulation Issues Not Further Analyzed

Due to the nature and scope of the proposed Project, implementation of the Project would not have the potential to result in a change in air traffic patterns at the Petaluma Municipal Airport or any other airport in the area. No further analysis of this issue is required.

Sonoma County opted out of performing Congestion Management Plans in 1997. Thus, there is no level of service standard established by the County Congestion Management Agency for designated roads or highways. No further analysis of this issue is required.

Senate Bill (SB) 743 requires that the California State Office of Planning and Research (OPR) develop revisions to the CEQA Guidelines establishing criteria for determining the significance of transportation impacts of projects within transit priority areas that promote the "reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." Upon certification of final CEQA Guidelines for determining transportation impacts, automobile delay, as described solely by LOS or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment under CEQA.

In response to SB 743, OPR released draft guidance in January 2016 for transportation impacts in CEQA documents. However, draft guidance is still evolving and final guidance has not yet been issued or certified. The City of Petaluma has chosen not to develop new thresholds regarding the evaluation of projects while official guidance at the state-level is still pending. For these reasons, the City of Petaluma has not made any changes to the standards of significance used for this study, which are consistent with those used in the Petaluma General Plan and other recent transportation impact studies.

Project Characteristics

Project Trip Generation

The proposed Project is a 278 unit[13] multi-family residential development to be located at the current northern terminus of Graylawn Avenue. The trip generation forecast for the Project is based on average rates published in *Trip Generation, 9th Edition* (Institute of Transportation Engineers [ITE], 2012). The ITE trip generation rates contain data based on research conducted in the United States over the past few decades for various types of land uses. For purposes of the Project, the trip generation rate for Land Use 220 "Apartments" was used. The *Trip Generation* manual defines this land use as "rental dwelling units located within the same building with at least three other dwelling units, including all types of apartment buildings."[14] The expected trip generation for the proposed Project is depicted in **Table 14-6**.

Table 14-6: Proposed Project Trip Generation Estimates

		Daily		AM Peak Hour				PM Peak Hour			
					Trips				Trips		
Land Use	Size[1]	Trip Rate[2]	Trips	Trip Rate[2]	In	Out	Total	Trip Rate[2]	In	Out	Total
Multi-family Residential (apartments)	278 DU	6.50	1,808	0.503	28	112	140	0.613	111	60	171

Notes: 1. Proposed Project is 278 units, however further analysis in this chapter uses trip generation for a 312-unit project to be consistent with previous analyses of the Project and to present a more conservative (worst case) analysis of the Project.

2. Trip rates based on data for fitted curve equations published in ITE Trip Generation, 9th Edition (2012)

DU – dwelling units

The Project is expected to generate 1,808 daily trips, with 140 of those occurring during the AM peak hour and 171 occurring during the PM peak hour.

Project Access and Circulation

Access to and from the Project site is proposed via existing Graylawn Avenue, and by the proposed "Shasta Extension to Graylawn" at-grade across the SMART rail tracks and connecting to the Project site, as well as via an EVA to Bernice Court. The Public Utilities Commission (PUC) regulates new at-grade rail crossings (such as the proposed Shasta Extension to Graylawn) and has suggested, in their comments on the Notice of Preparation for this EIR, that new at-grade rail crossings are to be avoided. Nevertheless, the Project proposes this rail crossing as a primary access to the Project, which has been evaluated in this EIR.

[13] Traffic analysis in this Chapter uses trip generation for a 312-unit project in order to maintain consistency with previous analysis and to present a more conservative (worst case) analysis than the Project currently being considered.

[14] *Trip Generation Manual, 9th Edition*, Institute of Transportation Engineers, 2012.

Internally to the Project site, the existing landscaped turnaround terminus of Graylawn Avenue would be retained, and Graylawn Avenue extended a short distance to connect at a 3-way intersection with the Shasta Extension to Graylawn and a new looped drive aisle.[15] This drive aisle is proposed to extend into the site to serve new residential units, circling around the western portion of the site and connecting back to the Shasta Extension to Graylawn near the rail tracks. A separate, short drive aisle would also serve new units on the easterly side of the site. The Shasta Extension to Graylawn and all internal drive aisles would be private roads (i.e., not for dedication to the City), but would be publicly accessible. All drive aisles would be unsignalized with stop-control for exiting traffic. All turning movements would be allowed at the drive aisles, with one lane of traffic entering and one lane of traffic exiting.

Pedestrian and Bicycle Facilities

A Class II bicycle lane is proposed on both sides of the proposed Shasta Extension to Graylawn, through the Project site and along the unimproved, existing section of the roadway just west of the tracks.

Sidewalks are proposed along the west side of Graylawn at the project site and along both sides of the short Graylawn Avenue extension to connect to the proposed Shasta Extension to Graylawn. Sidewalks would also be provided along both sides of the Shasta Extension to Graylawn through the project. The Project also proposes a sidewalk on the south side of the existing, unimproved segment of Shasta Avenue to connect to the sidewalk that exists at the western end of Shasta Avenue. The sidewalks on the Shasta Extension to Graylawn would provide direct pedestrian access to destinations on Petaluma Boulevard.

In addition to the sidewalks, the Project proposes to construct a new segment of the multi-purpose pathway along the Petaluma River. The multi-purpose pathway already exists to the south of the Project site, extending to its current terminus at the Oak Creek Apartments. The Project would provide for a continuation of that pathway to the north for the full length of the Project site's frontage along the River. Small stopping points with River overlooks and benches would be included as part of this trail system extension.

The Project will be conditioned to provide sufficient bicycle parking spaces in convenient locations to comply with the City of Petaluma's Zoning Ordinance.

Project Trip Distribution and Assignment

Trip distribution describes the general geographic locations of origins and destinations of Project-related vehicle trips. The trips associated with the Project are then assigned to the roadways and intersections per trip distribution assumptions included in the traffic model. The expected distribution of Project trips onto the adjacent roadway network was determined based on evaluation of existing traffic patterns, data included in the City's travel demand forecasting model, and complimentary land uses. **Figure 14-5** depicts the proposed Project trip distribution.

[15] See Chapter 3 for conceptual project designs and maps; and note that the project description states that the existing landscaped turnaround is proposed to stay.

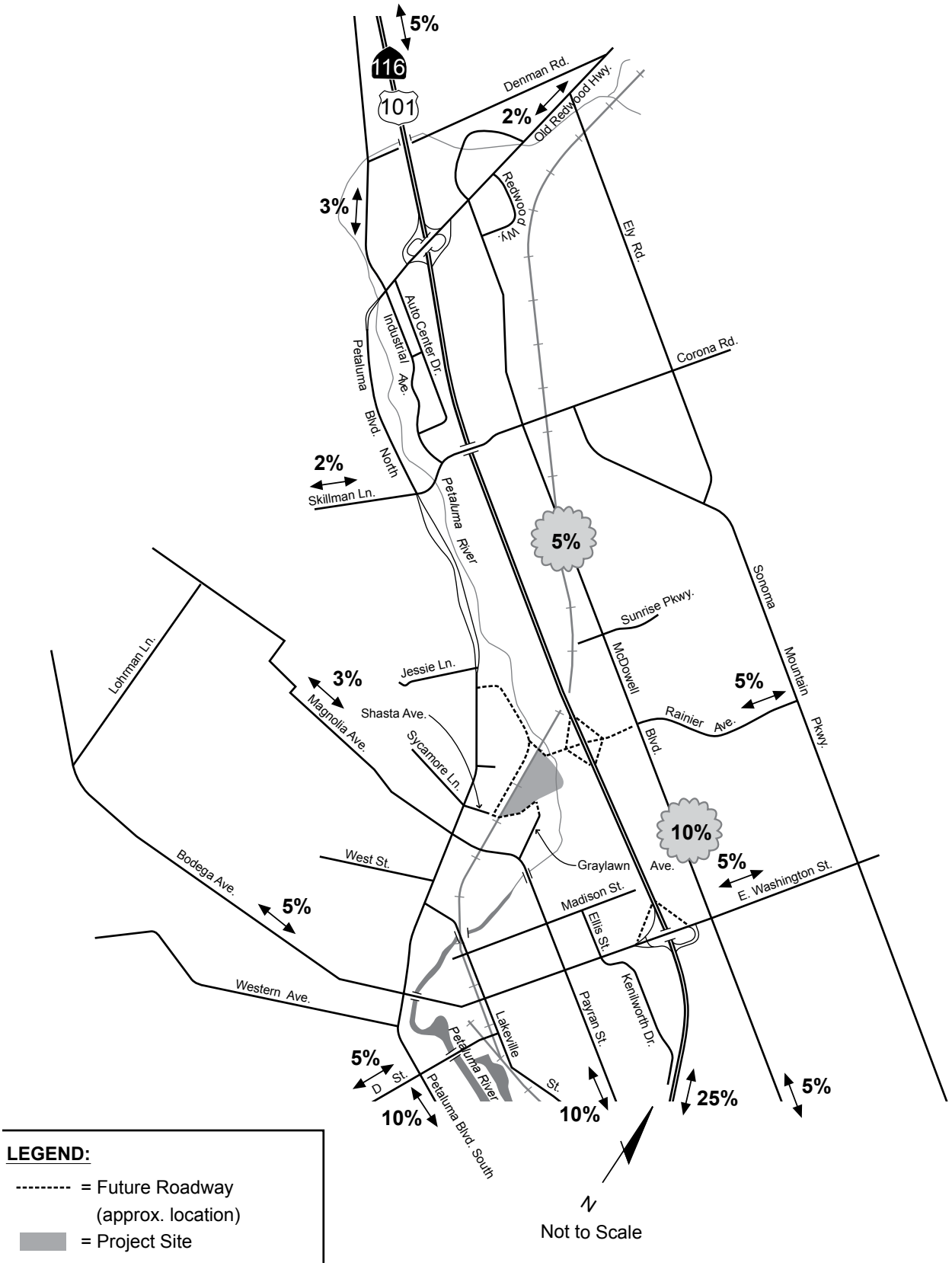


Figure 14-5
Project Trip Distribution

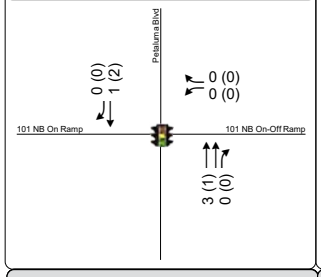
Source: Fehr & Peers

Based on the trip generation forecasts shown in Table 14-6 and the trip distribution depicted in Figure 14-5, the Project-related traffic increases were assigned to specific routes and intersections through the roadway network. From the Project site, there are two primary points of access and egress, Graylawn Avenue and the Shasta Extension to Graylawn over the railroad tracks. The trip distribution assignments for the Project indicate that of the total 140 AM and 171 PM peak hour trips, approximately two-thirds of these trips will use the Shasta Extension to Graylawn to and from the surrounding roadway network, and one-third of these trips will use Graylawn Avenue to access the Project site. From there, Project trips will be distributed throughout the City's street system and the freeway. The expected increases to AM and PM peak hour intersection turning movements due to the Project-only trips are shown in **Figure 14-6A and -6B**.

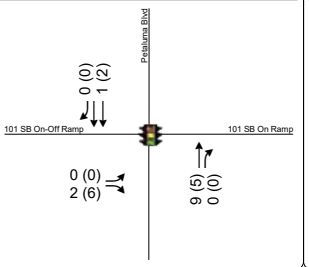
Intersection Operations

For each of the following analysis scenarios (Existing plus Project; Pipeline; Pipeline plus Project; Cumulative General Plan Build-out; and Cumulative General Plan Build-out plus Project), the "plus Project" scenarios all assume the Shasta Extension to Graylawn across the rail tracks as proposed by the Project. The Shasta Extension to Graylawn across the rail tracks is subject to approval by the CPUC. Based on comments received by the City from the CPUC staff on the Notice of Preparation for this EIR, CPUC approvals for this rail crossing are uncertain. However, until the City of Petaluma concludes the environmental review of the proposed Project, the CPUC cannot accept an official request from the Project applicant for this rail crossing or make its determination on acceptability. Therefore, the "plus Project" traffic analysis presented below includes the Shasta Extension to Graylawn and at-grade rail crossing as proposed. Recognizing the uncertainty and potential unlikelihood of the CPUC's approval of the proposed rail crossing, the Alternatives chapter of this EIR provides additional discussion of alternative means of access to the Project site.

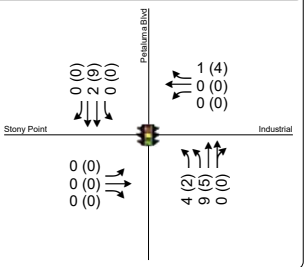
1. Petaluma Blvd/101 NB On-Off Ramp



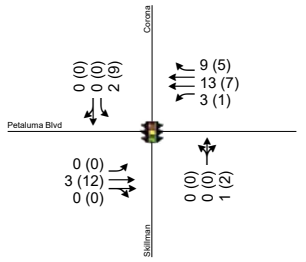
2. Petaluma Blvd/101 SB On-Off Ramp



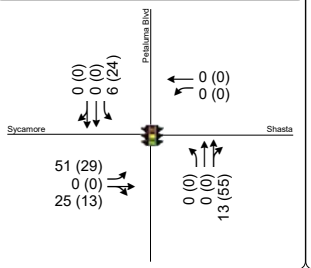
3. Petaluma Blvd/Stony Point/Industrial



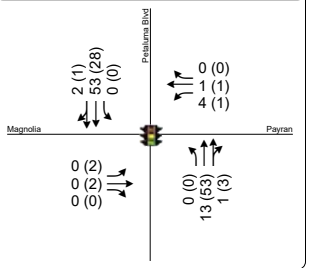
4. Corona/Skillman/Petaluma Blvd



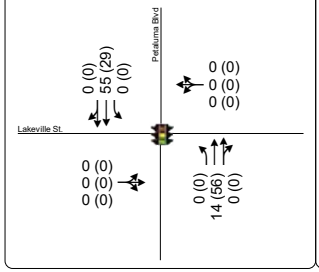
5. Petaluma Blvd/Sycamore/Shasta



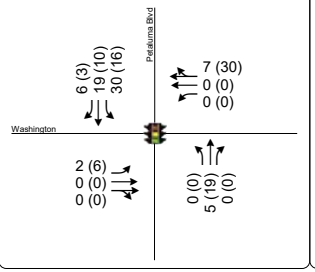
6. Petaluma Blvd/Magnolia/Payran



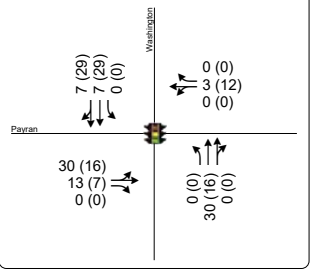
7. Petaluma Blvd/Lakeville St



8. Petaluma Blvd/Washington



9. Washington/Payran



LEGEND:

--------- = Future Roadway (approx. location)

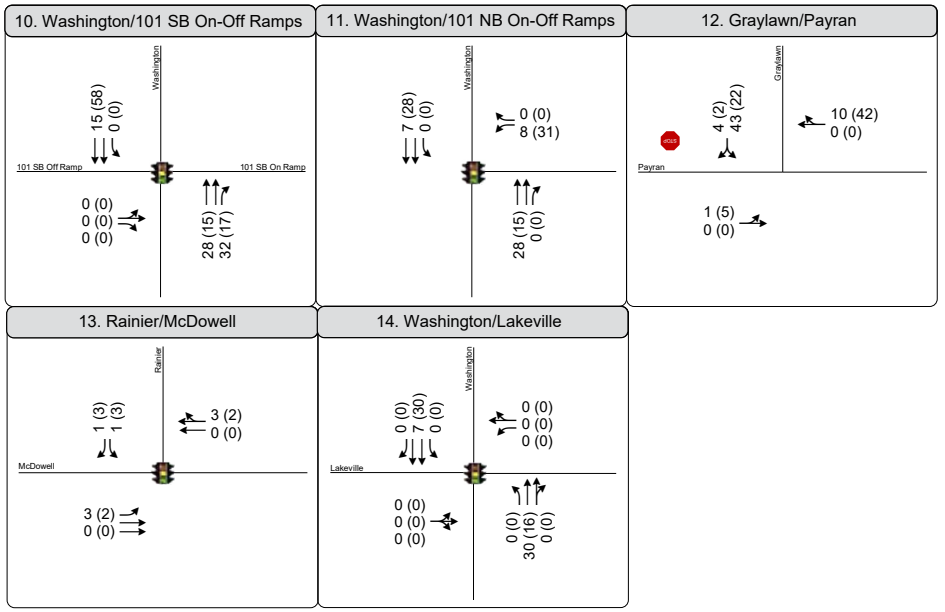
= Project Site

= Study Intersections

= Future Study Intersections

Figure 14-6A
Peak Hour Intersection Turning Movements, Project-Only Trips

Source: Fehr & Peers



LEGEND:

--------- = Future Roadway (approx. location)

= Project Site

= Study Intersections

= Future Study Intersections

Figure 14-6B
Peak Hour Intersection Turning Movements, Project-Only Trips

Source: Fehr & Peers

Existing plus Project - Intersection Level of Service

Transp-1: The addition of Project-generated traffic to existing traffic conditions would not cause a level of service (LOS) standard established by the City of Petaluma to be exceeded at any study area intersections. (**Less than Significant**)

The Project's traffic was added to existing traffic volumes to obtain "Existing plus Project" traffic volumes at study area intersections. **Figure 14-7A and -7B** depicts the "Existing plus Project" traffic volumes.

LOS calculations were conducted at each of the study intersections to evaluate intersection operations under "plus Project" conditions. The results are summarized in **Table 14-7**, and detailed technical calculations are included in the Appendix. The LOS analysis of "plus Project" conditions assumes the existing roadway network as used in the analysis for existing conditions. The planned roadway projects in Petaluma (as described earlier in this Chapter of the EIR and included in the Cumulative scenarios) have not been included in the Existing plus Project scenario.[16]

As indicated in Table 14-7, all study area intersections would operate at acceptable levels of service with the introduction of Project-generated traffic.

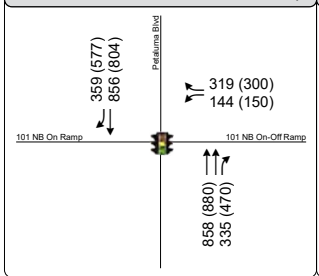
- There are no study area intersections that currently operate at LOS E or F, and no signalized intersections currently operating at acceptable LOS D or better under Existing conditions would deteriorate to an unacceptable level LOS E or F when Project-generated traffic is added.
- Similarly, no unsignalized intersections currently operating at acceptable LOS D or better under Existing conditions would deteriorate to an unacceptable level LOS E or F when Project-generated traffic is added, and the traffic volumes at the intersection would not satisfy Caltrans peak-hour volume warrant criteria for traffic signal installation.

Mitigation Measures

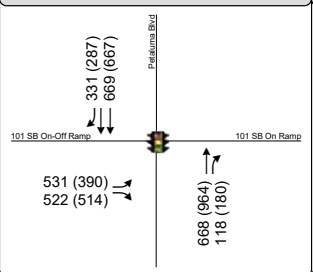
All study intersections would operate at LOS D or better, and no significant intersection-related Project impacts would occur in the study area as a result of the proposed Project. With no significant impacts, no mitigation measures are necessary under this scenario.

[16] As noted previously, the following transportation network improvements that have been completed since 2007/2008 are not included under Existing or Existing plus Project conditions: Old Redwood/HWY 101; East Washington/US 101 Southbound Ramps, East Washington/US 101 Northbound Ramps, and North McDowell Boulevard/Rainier Avenue. The analysis with these transportation network changes in place are included in the Pipeline and Cumulative Conditions analysis in order to present the potential impacts associated with the current and future transportation network.

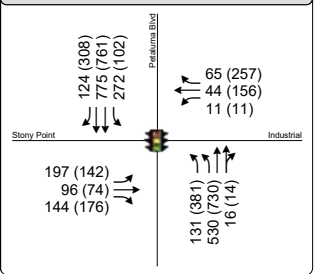
1. Petaluma Blvd/101 NB On-Off Ramp



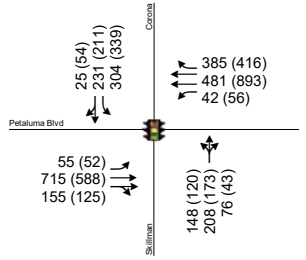
2. Petaluma Blvd/101 SB On-Off Ramp



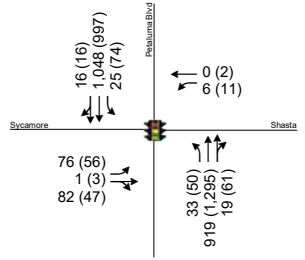
3. Petaluma Blvd/Stony Point/Industrial



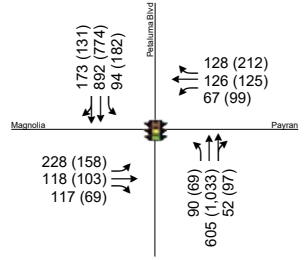
4. Corona/Skillman/Petaluma Blvd



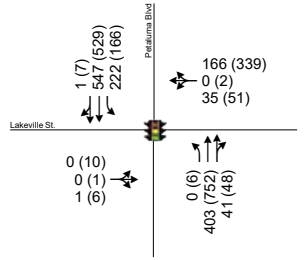
5. Petaluma Blvd/Sycamore/Shasta



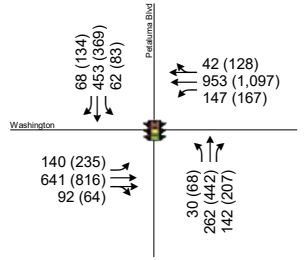
6. Petaluma Blvd/Magnolia/Payran



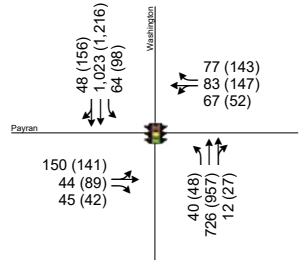
7. Petaluma Blvd/Lakeville St



8. Petaluma Blvd/Washington



9. Washington/Payran



LEGEND:

--------- = Future Roadway (approx. location)

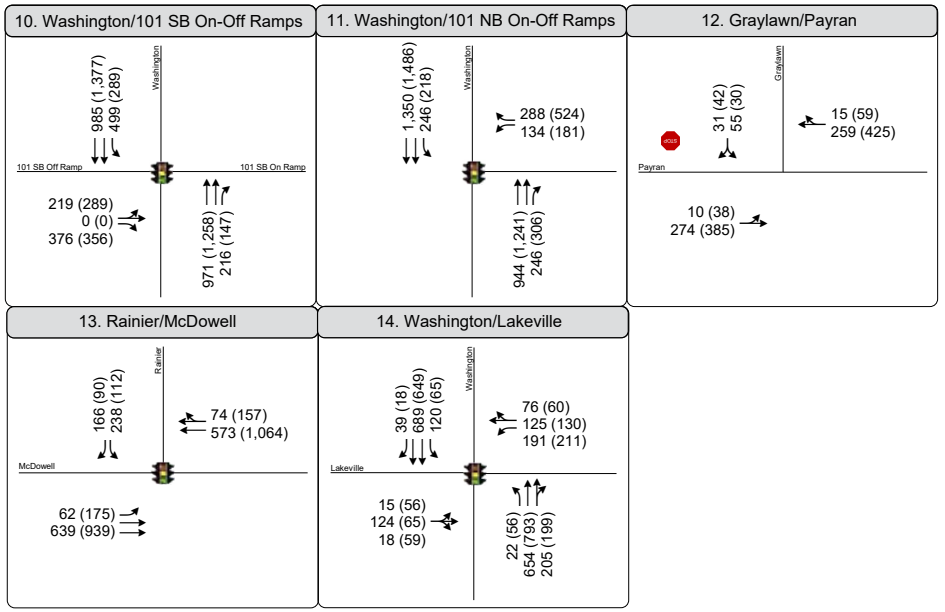
= Project Site

= Study Intersections

= Future Study Intersections

Figure 14-7A
Existing plus Project Peak Hour Traffic Volumes and Intersection Lane Configurations

Source: Fehr & Peers



LEGEND:

--------- = Future Roadway (approx. location)

= Project Site

= Study Intersections

= Future Study Intersections

Figure 14-7B
Existing plus Project Peak Hour Traffic Volumes and Intersection Lane Configurations

Source: Fehr & Peers

Table 14-7: Peak Hour Intersection Levels of Service – Existing Plus Project Conditions

Intersection	Traffic Control	Existing Conditions				Existing Plus Project Conditions[2]			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. U.S. 101 Northbound Ramps/Old Redwood Hwy	Signalized	12	B	12	B	12	B	12	B
2. U.S. 101 Southbound Ramps/Old Redwood Hwy	Signalized	25	C	25	C	25	C	25	C
3. Petaluma Boulevard North/Stony Point	Signalized	28	C	31	C	28	C	31	C
4. Petaluma Boulevard North/Corona Road	Signalized	40	D	40	D	40	D	41	D
5. Petaluma Boulevard North/Shasta Avenue	Signalized	<10	A	<10	A	<10	B	<10	A
6. Petaluma Boulevard North/West Payran Street	Signalized	21	C	22	C	22	C	22	C
7. Petaluma Boulevard North/Lakeville Street	Signalized	11	B	11	B	10	B	12	B
8. Petaluma Blvd/ Washington Street	Signalized	44	D	23	C	47	D	26	C
9. East Washington Street/ Payran Street	Signalized	17	B	26	C	19	B	29	C
10. East Washington Street/ U.S. 101 Southbound Ramps	Signalized	40	D	28	C	41	D	28	C
11. East Washington Street/ U.S. 101 Northbound Ramps	Signalized	14	B	17	B	15	B	17	B
12. West Payran Street/ Graylawn Avenue	Side-Street Stop	12	B	13	B	14	B	18	C
13. North McDowell Boulevard/Rainier Avenue	Signalized	11	B	10	B	11	B	11	B
14. East Washington Street/ Lakeville Street	Signalized	28	C	33	C	28	C	33	C

Notes: [1] Average control delay reported in seconds per vehicle for signalized intersections;
Average control, in seconds, of worst-case movement reported for side-street stop controlled intersections.
[2] Proposed Project is 278 units, however Plus Project analysis uses trip generation for a 312-unit project as described previously.
LOS - level of service **Bold** = unacceptable intersection operations; Shading = significant impact

Pipeline plus Project - Intersection Level of Service

Transp-2: The addition of Project-generated traffic to the Pipeline scenario (without the Project) would not cause a cumulative level of service standard established by the City of Petaluma to be exceeded at any study area intersection. (**Less than Significant**)

Near-Term, or "Pipeline" Scenario

The Pipeline scenario includes added traffic from other development projects that the City has already approved, but which have not yet been constructed. The locations of these "pipeline" development projects are shown on **Figure 14-8**, and a list of projects provided by the City that would contribute traffic to study area intersections under the Pipeline scenario is included in the Appendix.

The following changes to the existing roadway network have been completed and are assumed for Pipeline conditions:

- East Washington Interchange Improvements – This improvement involves the relocation of the northbound off-ramp approximately 100 feet to the west, additional northbound off-ramp lanes, and the construction of a new on-ramp serving traffic traveling from westbound Washington Street to northbound U.S. 101. This also includes a HOV left-turn lane to southbound on-ramp.
- North McDowell Boulevard / Rainier Avenue – additional EB approach leg and changed geometry per Deer Creek Village Plans.
- Interchange improvements at Old Redwood and Petaluma Boulevard South.
- Intersection modification at Lakeville and East Washington to accommodate SMART.

Other planned roadway improvement projects identified in the City of Petaluma's General Plan 2025 were not included in the Pipeline or Pipeline plus Project scenarios, as these roadway improvements are mostly longer-term improvements.

Expected traffic volume increases associated with these "pipeline" projects were added to Existing traffic volumes to obtain traffic volumes under "Pipeline Conditions".

Intersection Operations

Projected increases in traffic volumes for the approved Pipeline projects were obtained from land use information provided by the City and trip generation rates published in *Trip Generation, 9th Edition* from the Institute of Transportation Engineers (ITE). This traffic was added to the traffic volumes under Existing conditions, and the resultant Pipeline AM and PM peak hour intersection volumes are depicted on **Figure 14-9A and -9B**. The LOS and intersection delay for the Pipeline scenario is indicated in **Table 14-8**. Detailed technical calculations for the reported LOS are included in the Appendix.

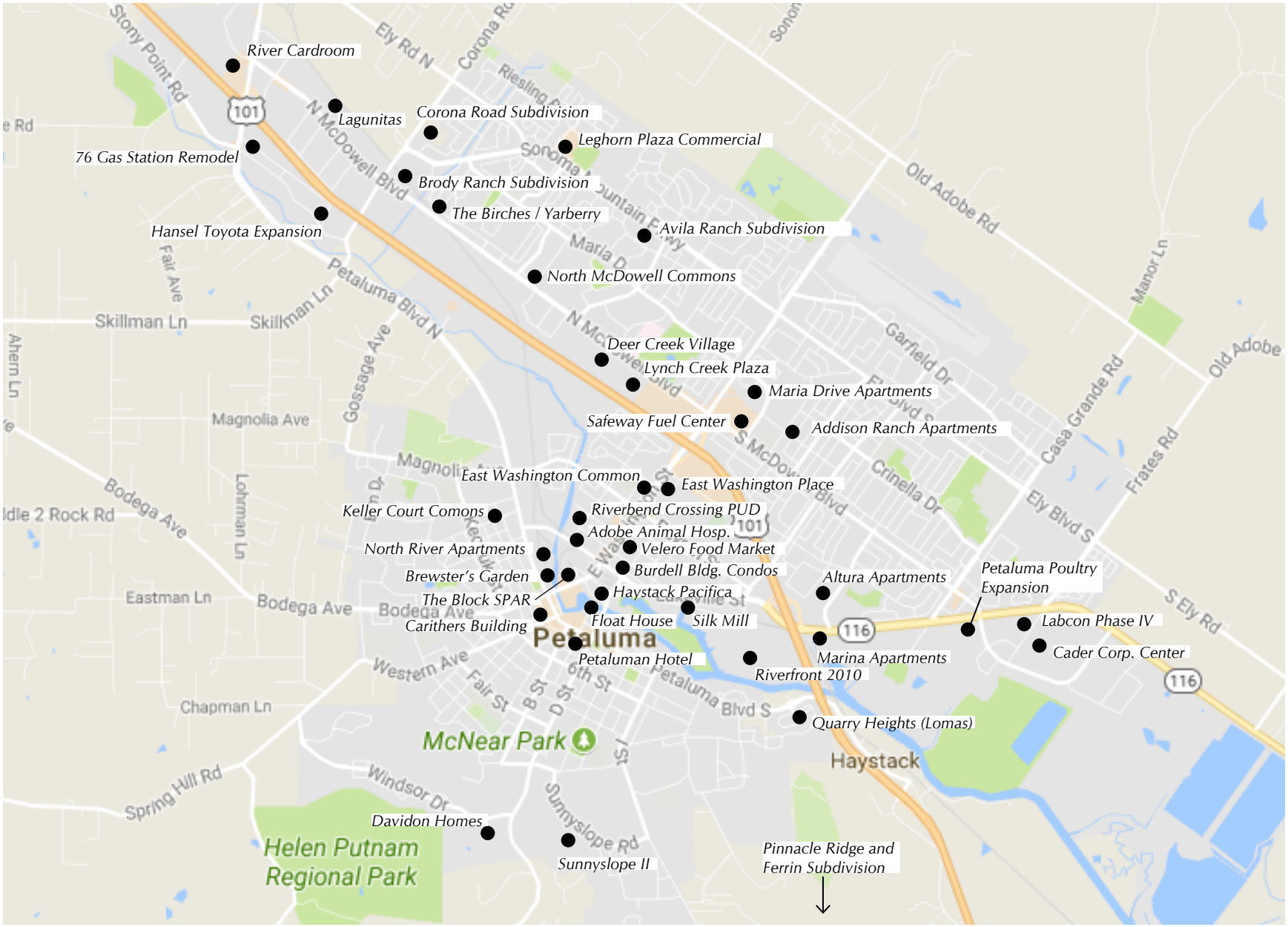
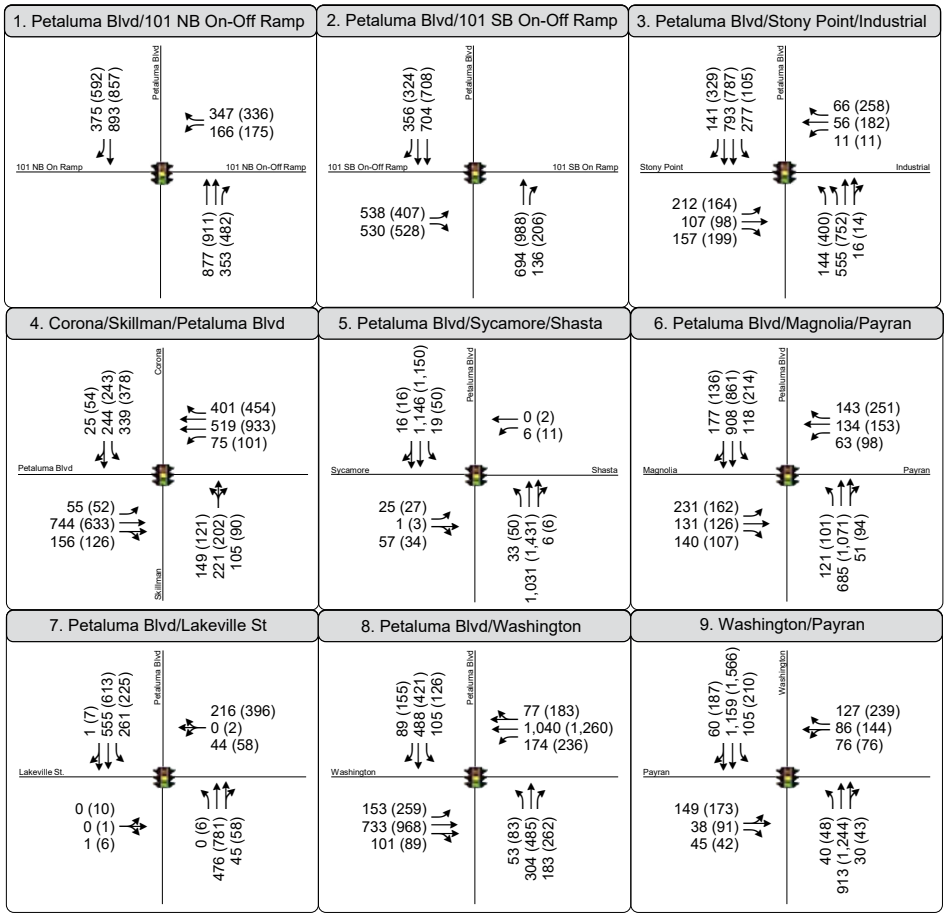


Figure 14-8
Approved and Pending "Pipeline" Projects



LEGEND:

--------- = Future Roadway (approx. location)

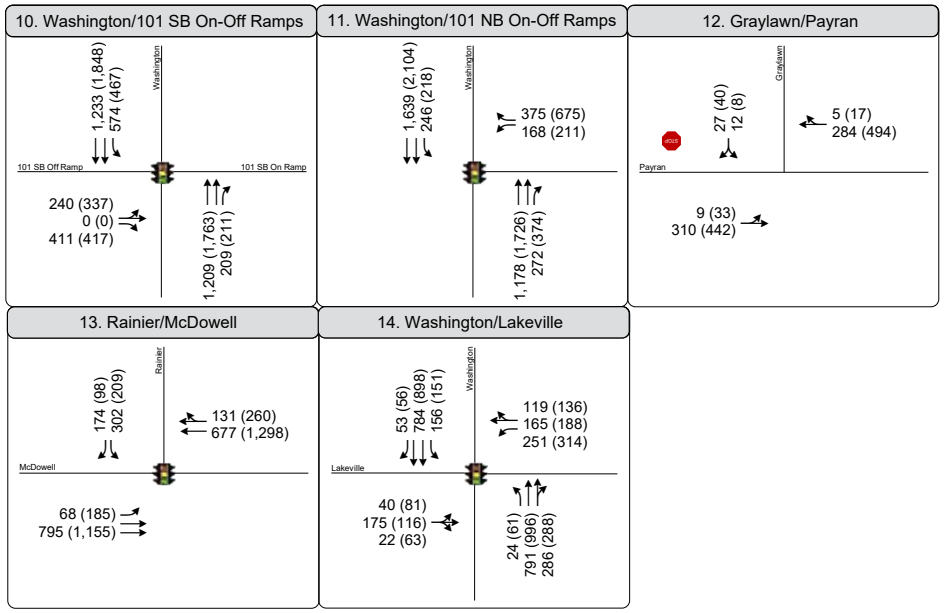
= Project Site

= Study Intersections

= Future Study Intersections

Figure 14-9A
Pipeline Peak Hour Traffic Volumes and Intersection Lane Configurations

Source: Fehr & Peers



LEGEND:

--------- = Future Roadway (approx. location)

= Project Site

= Study Intersections

= Future Study Intersections

Figure 14-9B
Pipeline Peak Hour Traffic Volumes and Intersection Lane Configurations

Source: Fehr & Peers

Table 14-8: Peak Hour Intersection Levels of Service – "Pipeline" Scenario

Intersection	Traffic Control	Existing Conditions				Pipeline Scenario			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. U.S. 101 Northbound Ramps/Old Redwood Hwy	Signalized	12	B	12	B	15	B	14	B
2. U.S. 101 Southbound Ramps/Old Redwood Hwy	Signalized	25	C	25	C	25	C	27	C
3. Petaluma Boulevard North/Stony Point	Signalized	28	C	31	C	32	C	34	C
4. Petaluma Boulevard North/Corona Road	Signalized	40	D	40	D	54	D	**57**	**E**
5. Petaluma Boulevard North/Shasta Avenue	Signalized	<10	A	<10	A	<10	A	<10	A
6. Petaluma Boulevard North/West Payran Street	Signalized	21	C	22	C	23	C	26	C
7. Petaluma Boulevard North/Lakeville Street	Signalized	11	B	11	B	12	B	14	B
8. Petaluma Blvd/ Washington Street	Signalized	44	D	23	C	**55**	**E**	41	D
9. East Washington Street/Payran Street	Signalized	17	B	26	C	20	B	49	D
10. East Washington Street/U.S. 101 Southbound Ramps	Signalized	40	D	28	C	41	D	44	D
11. East Washington Street/U.S. 101 Northbound Ramps	Signalized	14	B	17	B	18	B	18	B
12. West Payran Street/Graylawn Avenue	Side-Street Stop	12	B	13	B	12	B	15	B
13. North McDowell Boulevard/Rainier Avenue	Signalized	11	B	10	B	24	C	44	D
14. East Washington Street/ Lakeville Street	Signalized	28	C	33	C	46	D	**71**	**E**

Notes: [1] Average control delay reported in seconds per vehicle for signalized intersections.

Average control, in seconds, of worst-case movement reported for side-street stop controlled intersections

Intersection signal timings have been optimized to meet future demand volumes at some locations under Pipeline conditions

Bold = unacceptable intersection operations

The City of Petaluma has an active program to ascertain that signal timings are efficiently serving the peak period traffic. Signal timing modifications are generally a maintenance issue performed on a regular basis. Therefore, it was assumed that the City would adjust the intersection signal timings to accommodate for the traffic related to specific Pipeline projects. The analysis of Pipeline conditions assumes that intersection signal timings would be modified at Petaluma Boulevard/Washington Street, and that the signal timings of U.S. 101 Northbound Ramps/Washington and U.S. 101 Southbound Ramps/Washington would be modified to provide better progression through the closely spaced intersections. The results of the Pipeline scenario LOS summarized in Table 14-8 assume the above signal timing modifications.

With these signal-timing modifications, most study intersections would operate acceptably, with the following exceptions:

- The Petaluma Boulevard North/Corona Road (intersection #4) would degrade from LOS D to LOS E during the PM peak hour.
- The Petaluma Boulevard/Washington Street (intersection #8) would degrade from LOS D to LOS E during the AM peak hour.
- The East Washington Street/Lakeville Street (intersection #14) would degrade from LOS C to LOS E during the PM peak hour.

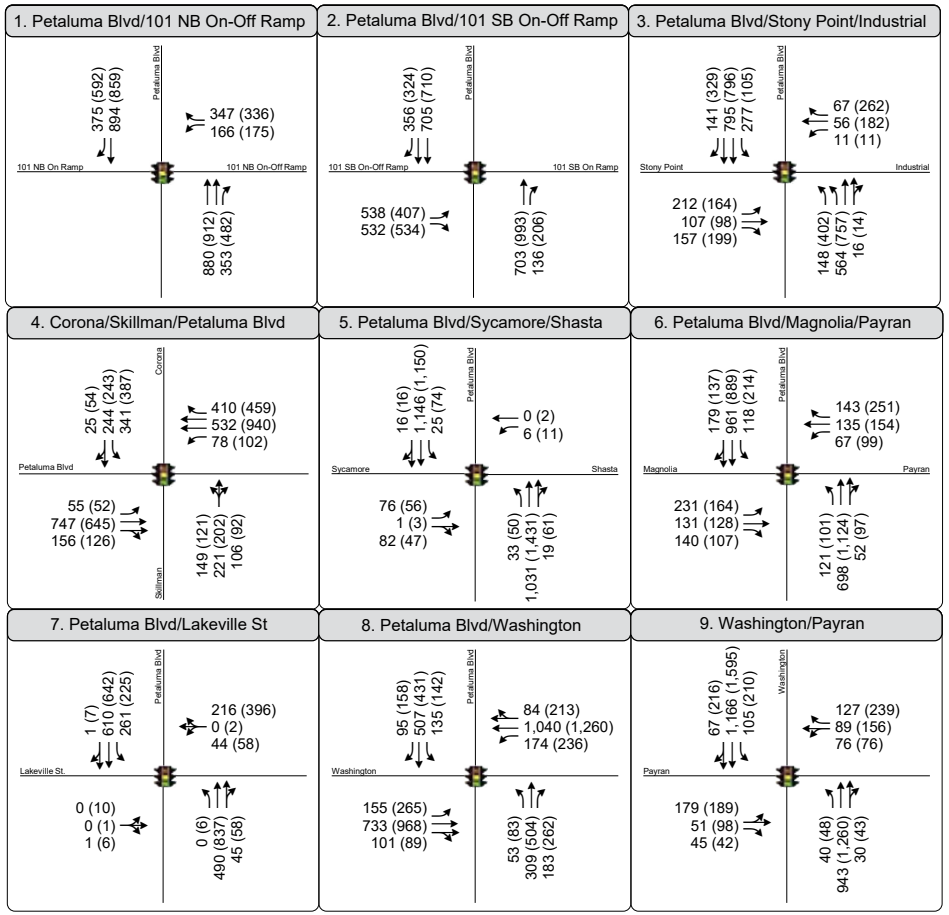
At these intersections, the Pipeline scenario (without accounting for the Project) would result in unacceptable intersection operations (LOS E or worse).

Pipeline plus Project Scenario - Intersection Level of Service

The Project's traffic was added to the projected traffic volumes under the Pipeline scenario to obtain traffic volumes under the "Pipeline plus Project" scenario. **Figure 14-10A and -10B** depicts these volumes.

Signal timing improvements as assumed under the Pipeline scenario were also included under Pipeline plus Project conditions. The LOS analysis of "Pipeline plus Project" scenario assumes the existing roadway network, similar to the analysis conducted for the Pipeline scenario, with the addition of Project roadways (including the Shasta Extension to Graylawn across the rail tracks to the Project site).

LOS calculations were conducted at all study area intersections to evaluate intersection operations under the "plus Project" scenario. The results are summarized in **Table 14-9**, and detailed technical calculations are included in the Appendix. As indicated in Table 14-9, all study area intersections would operate at similar levels of service with the introduction of Project-related traffic, as compared to the Pipeline without Project scenario.



LEGEND:

--------- = Future Roadway (approx. location)

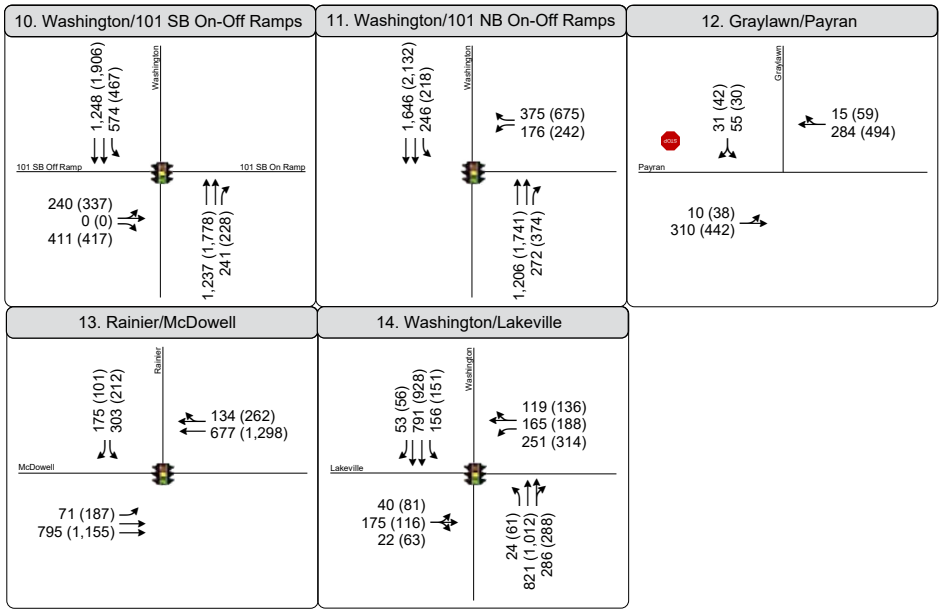
= Project Site

= Study Intersections

= Future Study Intersections

Figure 14-10A
Pipeline plus Project Peak Hour Traffic Volumes and Intersection Lane Configurations

Source: Fehr & Peers



LEGEND:

--------- = Future Roadway (approx. location)

= Project Site

= Study Intersections

= Future Study Intersections

Figure 14-10B
Pipeline plus Project Peak Hour Traffic Volumes and Intersection Lane Configurations

Source: Fehr & Peers

Table 14-9: Peak Hour Intersection Levels of Service – "Pipeline" Plus Project Conditions

Intersection	Traffic Control	Pipeline Scenario (without project)				Pipeline plus Project Scenario[2]			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. U.S. 101 Northbound Ramps/Old Redwood Hwy	Signalized	15	B	14	B	15	B	14	B
2. U.S. 101 Southbound Ramps/Old Redwood Hwy	Signalized	25	C	27	C	25	C	28	C
3. Petaluma Boulevard North/Stony Point	Signalized	32	C	34	C	32	C	34	C
4. Petaluma Boulevard North/Corona Road	Signalized	54	D	**57**	**E**	55	D	**57**	**E**
5. Petaluma Boulevard North/Shasta Avenue	Signalized	<10	A	<10	A	<10	A	<10	A
6. Petaluma Boulevard North/West Payran Street	Signalized	23	C	26	C	23	C	27	C
7. Petaluma Boulevard North/Lakeville Street	Signalized	12	B	14	B	12	B	15	B
8. Petaluma Blvd/ Washington Street	Signalized	**55**	**E**	41	D	**57**	**E**	49	D
9. East Washington Street/ Payran Street	Signalized	20	B	49	D	24	C	49	D
10. East Washington Street/ U.S. 101 Northbound Ramps	Signalized	41	D	44	D	42	D	44	D
11. East Washington Street/ U.S. 101 Southbound Ramps	Signalized	18	B	18	B	18	B	19	B
12. West Payran Street/ Graylawn Avenue	Side-Street Stop	12	B	15	B	16	C	21	C
13. North McDowell Boulevard/Rainier Avenue	Signalized	24	C	44	D	24	C	44	D
14. East Washington Street/ Lakeville Street	Signalized	46	D	**71**	**E**	46	D	**72**	**E**

Notes: [1] Average control delay reported in seconds per vehicle for signalized intersections.

Average control, in seconds, of worst-case movement reported for side-street stop controlled intersections.

Intersection signal timings have been optimized to meet future demand volumes under Pipeline and Pipeline Plus Project conditions

Proposed Project is 278 units, however Plus Project analysis uses trip generation for a 312-unit project.

LOS - level of service

Bold = unacceptable intersection operations; Shading = significant impact

The following intersections, which would operate at LOS E under the Pipeline scenario, would continue to operate at an LOS E with the addition of Project traffic, and Project-generated traffic would not cause these intersections to degrade to LOS F (the threshold of significance for signalized intersections that operate at LOS E under conditions without the Project is whether the LOS deteriorates to LOS F with the addition of Project-generated traffic):

- The Petaluma Boulevard North/Corona Road (intersection #4) would remain at LOS E during the PM peak hour when Project-generated traffic is added to the Pipeline scenario. The average delay at this intersection would not increase (i.e., would remain at 57 seconds).
- The Petaluma Boulevard/Washington Street (intersection #8) would remain at LOS E during the AM peak hour when Project-generated traffic is added to the Pipeline scenario. The average delay at this intersection would increase by 2 seconds (from 55 seconds to 57 seconds).
- The East Washington Street/Lakeville Street (intersection #14) would remain at LOS E during the PM peak hour when Project-generated traffic is added to the Pipeline scenario. The average delay at this intersection would increase by 1 second (from 71 seconds to 72 seconds).

All other study intersections would continue to operate at acceptable levels of service (D or better). None of the intersections that are operating at LOS E under the Pipeline scenario would degrade from LOS E to LOS F when Project-generated traffic is added.

Mitigation Measures

None needed. The Project would not make a significant contribution of traffic under the Pipeline scenario, and the Project's impacts would be less than significant.

Cumulative Plus Project - Intersection Level of Service

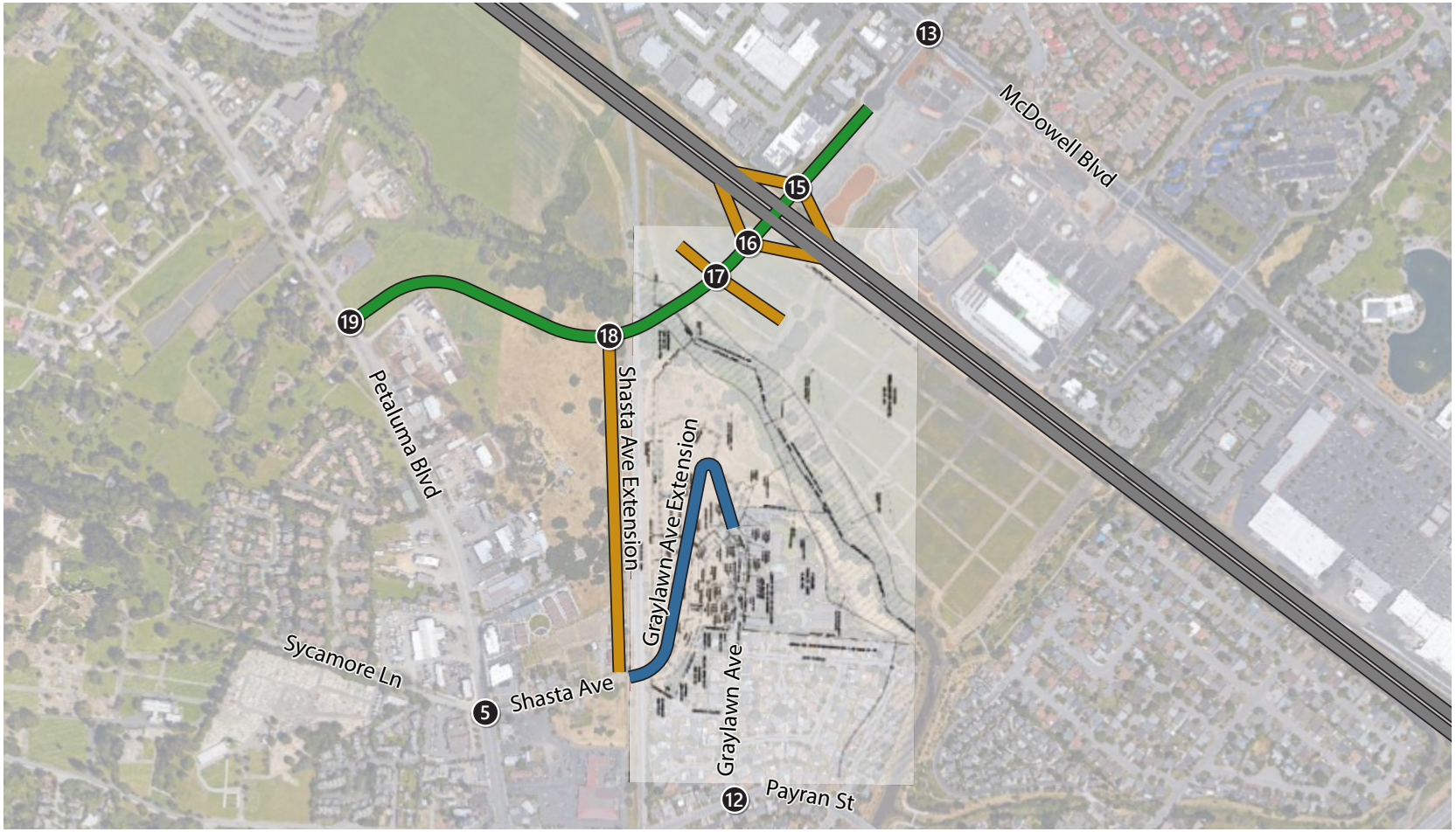
Transp-3: The addition of Project-generated traffic to the Cumulative scenario (without the Project) would cause a cumulative level of service (LOS) standard established by the City of Petaluma to be exceeded at one study area intersection. (**Less than Significant with Mitigation**)

Cumulative Scenario

The Cumulative scenario represents projected future transportation conditions in the Project's study area based on General Plan build-out. This scenario is inclusive of all Pipeline projects described above, and represents total development corresponding to the year 2025 based on the City's General Plan 2025. General Plan build-out conditions include a version of the proposed Project and volumes associated with the Project were manually removed to create a Cumulative "without project" scenario. Therefore, this scenario does not include traffic generated from the Project site.

Cumulative Scenario Roadway Network

Several major roadway improvements were assumed as part of the Cumulative scenario in addition to those described for Pipeline conditions. These major roadway projects are shown on **Figure 14-11** and described below:



Roadway Proposed by Project

Rainier Avenue Extension (EIR Certified)

Other possible roadways envisioned under the Petaluma General Plan but not yet approved (Shasta Avenue Extension, full Rainier Avenue interchange, access roadways north of Petaluma River)

U.S. 101 Marin Sonoma Narrows Project

Study Intersections

17 Intersection included in Rainier Extension EIR, cumulative conditions

Figure 14-11
Cumulative Roadway Network in Project Vicinity

Source: City of Petaluma 2025 General Plan, Figure 5-1: Street Classifications

Rainier Avenue Interchange

The Cumulative scenario assumes that the Rainier Avenue Interchange, as envisioned under the Rainier Avenue Cross Town Connector Project Draft EIR [17] and the General Plan 2025 Mobility chapter, will be implemented. The Rainier Avenue Interchange project includes extending Rainier Avenue from McDowell Boulevard on the east to Petaluma Boulevard North on the west. The connector would travel below the elevated freeway at this location, and then span the Petaluma River and SMART corridor with a bridge structure (see **Figure 14-12**). Although, not proposed as part of the Rainier Cross Town Connector Project, the EIR for that project and the General Plan EIR consider the cumulative scenario to include direct access to Highway 101 from the Rainier Avenue Interchange. These interchange ramps have not yet been designed or proposed, but are studied to disclose that full interchange access may eventually be developed at this location. Therefore, consistent with the General Plan buildout, this cumulative analysis presumes that full interchange ramps and other access roadways to Rainier Avenue are provided from the Rainier Avenue Cross Town Connector.

North Petaluma Boulevard Grid

Pursuant to General Plan goal 5.3, a grid of streets will be developed near Petaluma Boulevard adjacent to the Rainier Avenue extension. A key element of this planned grid street system include a Shasta Extension to Rainier, that would arc northward on the west side of the SMART rail tracks to a new intersection connection at Rainier Avenue. Another change to the roadway network in this area is the addition of a right-turn pocket on westbound Corona Road at Petaluma Boulevard.

U.S. 101 Marin-Sonoma Narrows Project

Widening of U.S. 101 from four to six lanes to include a new high-occupancy-vehicle (HOV) lane, as part of the Marin-Sonoma Narrows Project, is assumed to be complete. This widening project is included in Tier 1 funding in the Metropolitan Transportation Commission's Regional Transportation Plan, meaning that funding is a top priority and construction is likely. Therefore, the Cumulative scenarios assume this improvement to US 101 would be in place.

Old Redwood Highway Interchange

The City has widened the Old Redwood Highway/U.S. 101 interchange to accommodate two lanes of travel in each direction on Old Redwood Highway. The Old Redwood Highway/US 101 over-pass and on/off ramps, as well as Old Redwood Highway, were improved/widened from Stony Point Road to North McDowell Boulevard. The City will be implementing coordinated traffic signal timing in fall of 2017 on Old Redwood Highway between Stony Point and Redwood Way, including the Caltrans on/off ramps.

[17] City of Petaluma, Rainier Avenue Cross Town Connector Project Draft EIR, 2014

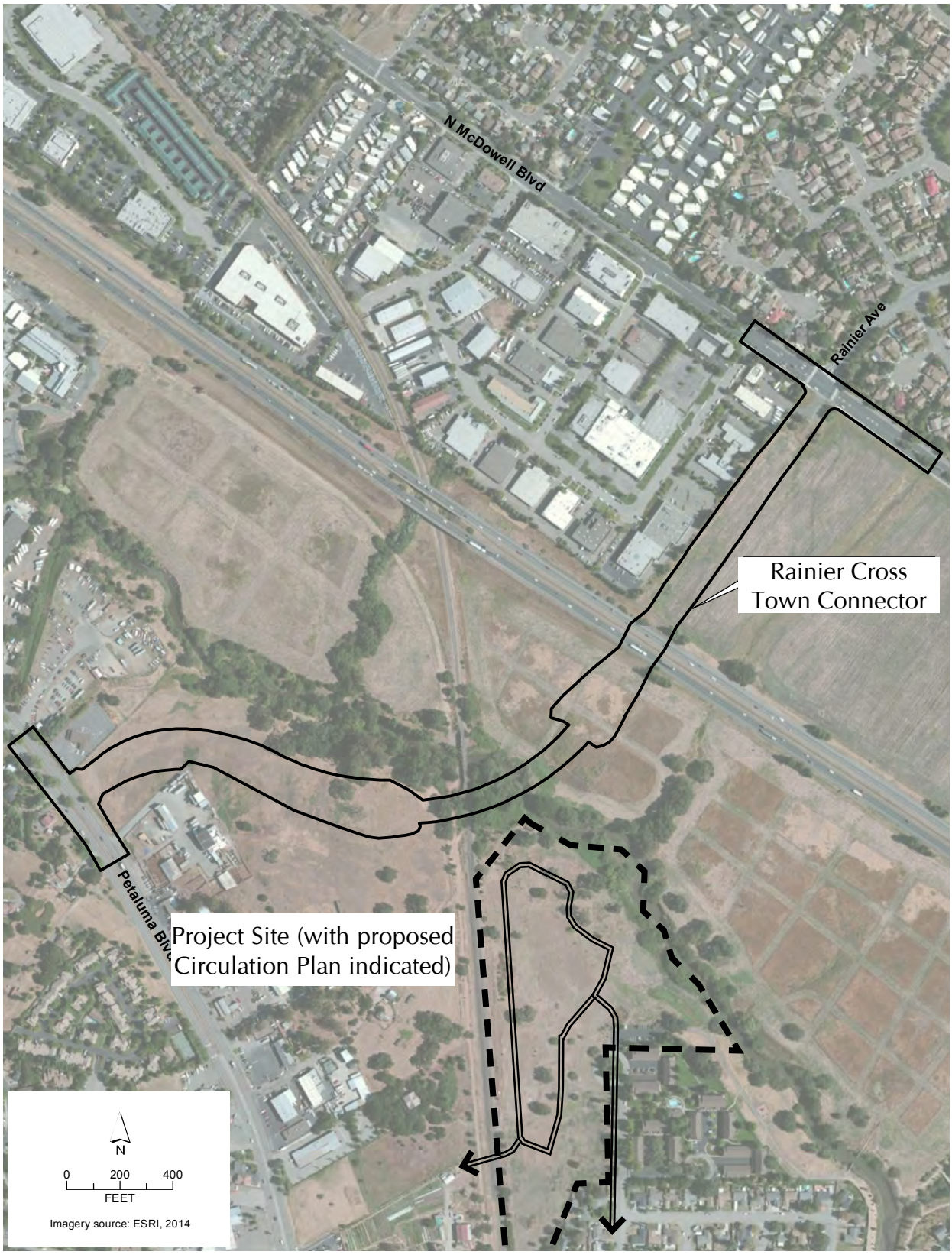


Figure 14-12
Rainier Cross Town Connector Project

Source: City of Petaluma, Rainier Cross Town Connector Draft EIR, July 2014

Study Area Intersections

With addition of the Rainier Avenue Interchange to the Cumulative roadway network, five additional study area intersections are analyzed as part of the Cumulative scenario. These additional intersections include:

15. Rainier Avenue/U.S. 101 Northbound Ramps,
16. Rainier Avenue/U.S. 101 Southbound Ramps,
17. Rainier Avenue/Johnson North Access Road[18] (East Side of Petaluma River)
18. Rainier Avenue/Shasta Avenue Extension, and
19. Rainier Avenue/Petaluma Boulevard North.

The additional intersection #17 above (at Rainier Avenue/Johnson North Access Road) was conceptualized as a possible future connection on the east side of the River as part of the Rainier Cross Town Connector EIR. The currently vacant property on the east side of the River is designates as Commercial in the City General Plan, and could be accessed via a future roadway intersection with Rainier. This conceptualized future intersection is located on the east side of the River, and does not connect to the Project site. A possible future connection of the Johnson North Access Road at Rainier Avenue would require subsequent analysis at the project level, if and when a development application for the undeveloped Johnson lands on the east side of the River where to be received. Nonetheless, for cumulative analysis purposes consistent with the City's General Plan and the certified EIR for Rainier Cross Town Connector, this EIR considers a possible future connection under the Cumulative scenario.

Like Pipeline conditions, signal optimization is included in the Cumulative scenario for all study area intersections. Each traffic signal in the City gives green time to specific movements depending on the amount of traffic received throughout the day. Substantial changes in traffic volumes can occur over time. The City of Petaluma has a careful monitoring and updating approach to maintain optimum signal timings. Therefore, it was assumed that by the year 2025, the signal timings would be modified from existing conditions to adapt to Cumulative traffic volumes. To account for this expected change, signal timings were optimized as part of the Cumulative traffic analysis.

Traffic Forecasts

The citywide traffic model projects traffic volumes on specific roadway segments based on inputs such as land use, roadway capacities and travel behavior. These inputs are consistent with the build-out of the land uses and the roadway network contemplated in the Petaluma General Plan. However, traffic models are not refined enough to accurately predict intersection turning movement volumes. Therefore, the specific turning movements for the Cumulative scenario at each study area intersection were estimated using the Furness process. This process uses linear regression equations to establish future turning movements based on future link volumes and current turning movement volumes. However, because the Furness process is not appropriate for use at intersections where a new leg is being added, the traffic forecasts for the intersections along the Rainier Avenue Connector/Interchange were developed based on the output from the traffic model, with manual adjustments based on engineering judgment to match the projected volumes at the adjacent intersections. Cumulative traffic

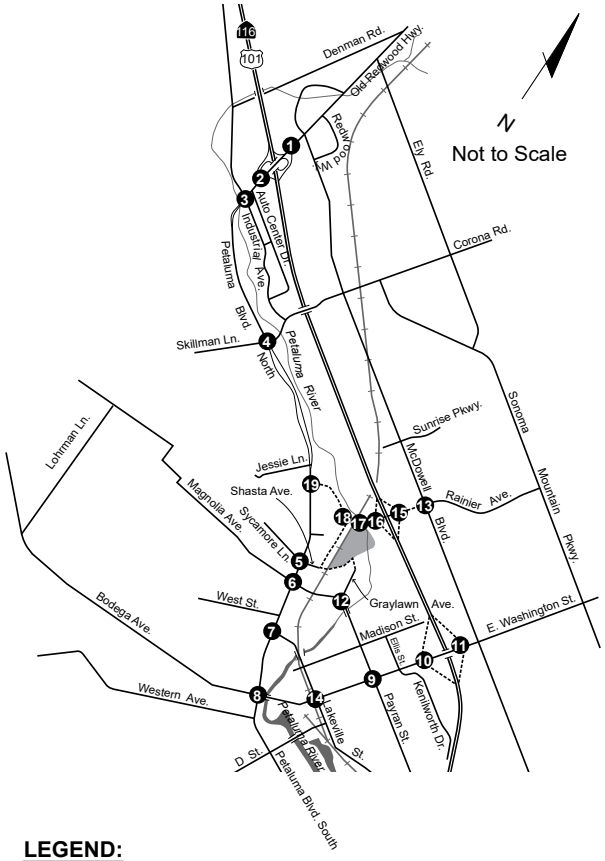
[18] Under the Rainier EIR, the "Johnson North Access Road" is termed "Sid Commons Driveway", which is located on the east side of the Petaluma River and is not directly related to the subject project.

forecasting methods are consistent with previous Cumulative analysis performed for the Petaluma General Plan, Rainier Avenue Cross Town Connector EIR, and other recent studies.

Figure 14-13A and -13B shows the resulting turning movement volumes at each study intersection under the Cumulative scenario, including the Rainer Avenue Connector/Interchange but not including traffic generated by the Project.

Intersection Operations

Intersection operations under the Cumulative scenario were analyzed based on the peak hour intersection turning movement volumes shown in Figure 14-13A and -13B. These figures shows Cumulative traffic volumes based on an assumed re-assignment resulting from inclusion of the Rainier Avenue Connector and associated interchange, as well as the Shasta Extension to Rainier. **Table 14-10** presents the results of the analysis. Detailed calculations are presented in the Appendix.



LEGEND:

- ---------- = Future Roadway (approx. location)
- ❶ = Study Intersections
- XX (YY) = AM (PM)

*Intersection #17 provides access to the potential development site East of the Petaluma River, but does not connect to the proposed project.

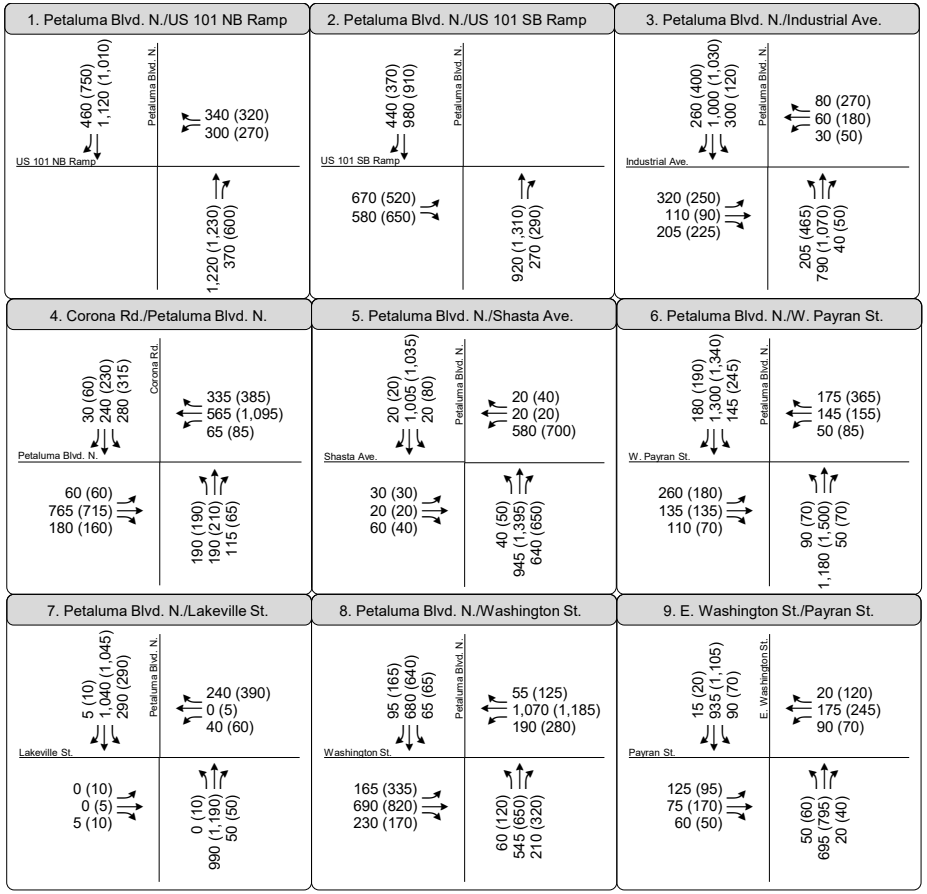
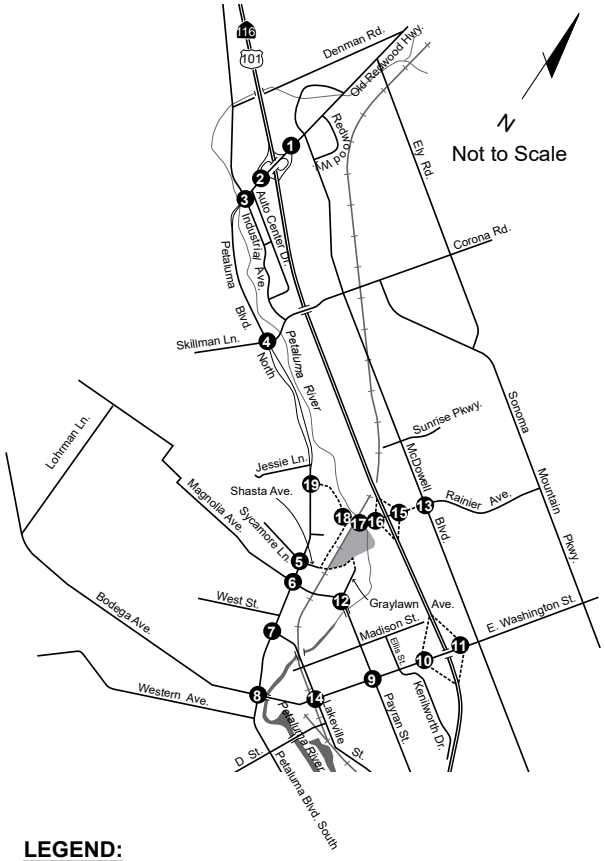


Figure 14-13A
Cumulative with Rainier Avenue Interchange Traffic Volumes and Intersection Lane Configurations

Source: Fehr & Peers



LEGEND:

- ..... = Future Roadway (approx. location)
- ❶ = Study Intersections
- XX (YY) = AM (PM)

*Intersection #17 provides access to the potential development site East of the Petaluma River, but does not connect to the proposed project.

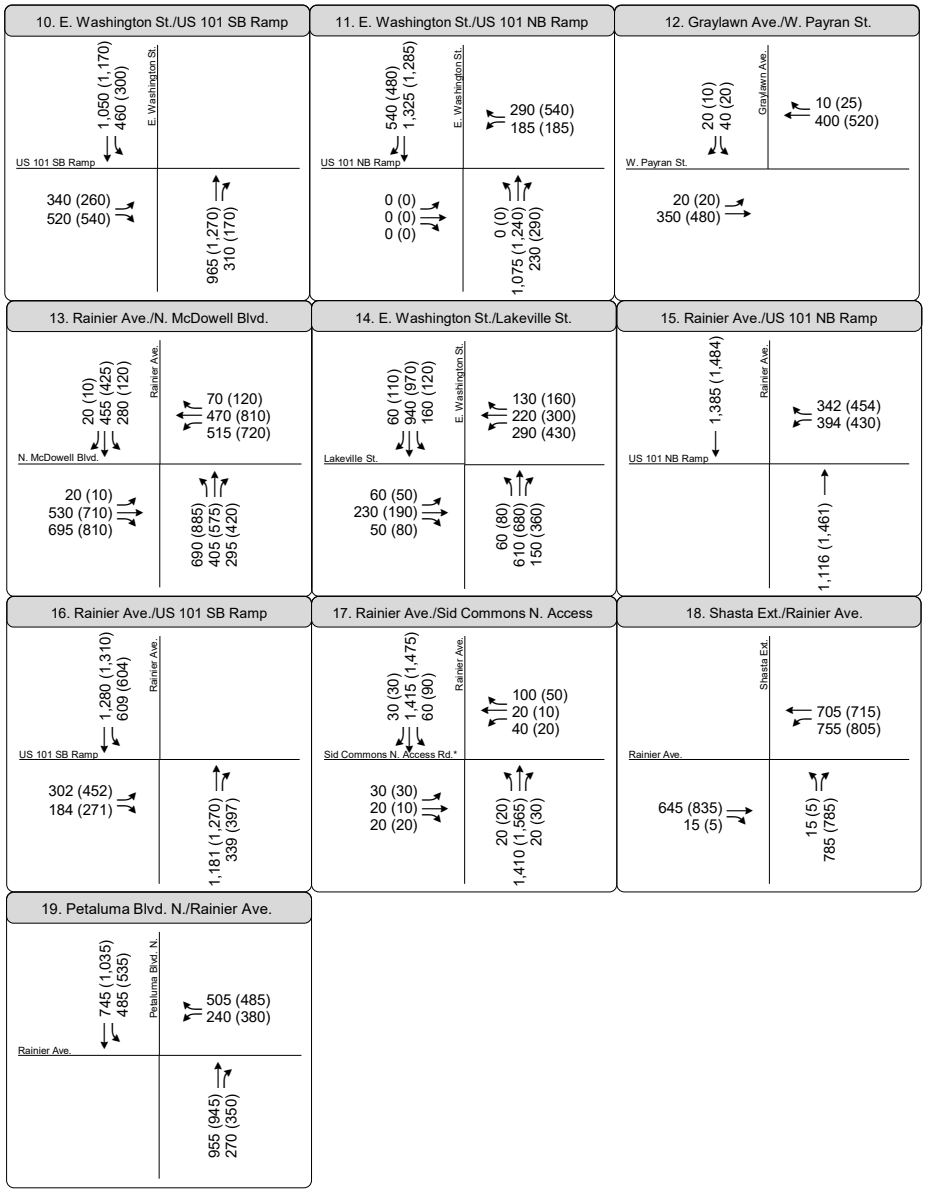


Figure 14-13B
Cumulative with Rainier Avenue Interchange Traffic Volumes and Intersection Lane Configurations

Source: Fehr & Peers

Table 14-10: Peak Hour Intersection Levels of Service – Cumulative Scenario

		Cumulative Scenario			
		AM Peak Hour		PM Peak Hour	
Intersection	Traffic Control	Delay[1]	LOS	Delay	LOS
1. U.S. 101 Northbound /Old Redwood Hwy	Signalized	<10	A	<10	A
2. U.S. 101 Southbound /Old Redwood Hwy	Signalized	17	B	14	B
3. Petaluma Boulevard North/Stony Point	Signalized	40	D	35	D
4. Petaluma Boulevard North/Corona Road	Signalized	45	D	51	D
5. Petaluma Boulevard North/Shasta Avenue	Signalized	43	D	**>80**	**F**
6. Petaluma Boulevard North/West Payran St.	Signalized	24	C	25	C
7. Petaluma Boulevard North/Lakeville Street	Signalized	14	B	18	B
8. Petaluma Boulevard/Washington Street	Signalized	33	**C**	45	D
9. East Washington Street/Payran Street	Signalized	22	C	24	C
10. East Washington/U.S. 101 Southbound	Signalized	30	C	29	C
11. East Washington/U.S. 101 Northbound	Signalized	<10	A	15	B
12. West Payran Street/Graylawn Avenue	Side-St. Stop	15	B	18	C
13. North McDowell Boulevard / Rainier Avenue	Signalized	42	D	**75**	**E**
14. East Washington Street/Lakeville Street	Signalized	22	C	29	C
15. Rainier Avenue/U.S. 101 NB Ramps	Signalized	10	B	16	B
16. Rainier Avenue/U.S. 101 SB Ramps	Signalized	16	B	21	C
17. Rainier Avenue/Johnson North Access Road[2]	Signalized	16	B	10	B
18. Rainier Avenue/Shasta Extension	Signalized	12	B	12	B
19. Rainier Avenue/Petaluma Boulevard	Signalized	20	C	23	C

Notes: **Bold** indicates unacceptable LOS by City standards.

[1] Average control delay reported in seconds per vehicle for signalized and all-way stop controlled intersections.

Average control, in seconds, of worst-case movement reported for side-street stop controlled intersections.

LOS - level of service

[2] Johnson North Access Road provides access to the potential development site east of the river, but does not connect to the proposed project.

Under the Cumulative scenario (without the Project), buildout of the General Plan would cause the following two intersections to operate at LOS E or F conditions:

- The Petaluma Boulevard North/Shasta Avenue intersection (Intersection #5), which currently operates at LOS A during both AM and PM peak periods, would operate at LOS F in the PM peak hour.
- The McDowell Boulevard/Rainier Avenue intersection (Intersection #13), which currently operates at LOS B during the PM peak period, would operate at LOS E in the PM peak hour.

The increased traffic congestion at these locations is due to the addition of new traffic generated by the future land uses projected under the General Plan (Intersection #13) or shifting travel patterns due to the future Rainier Avenue and Shasta Avenue extensions (Intersection #5).[19] All other study intersections are expected to operate acceptably, at LOS D or better conditions. Traffic operations are projected to improve at many intersections between Pipeline and Cumulative conditions due to the addition of the Rainier Avenue Extension and Interchange project. This project would allow traffic to shift to Rainier Avenue from East Washington Street and Corona Avenue in the future. The following three intersections are projected to improve from LOS E to LOS D or better under Cumulative conditions:

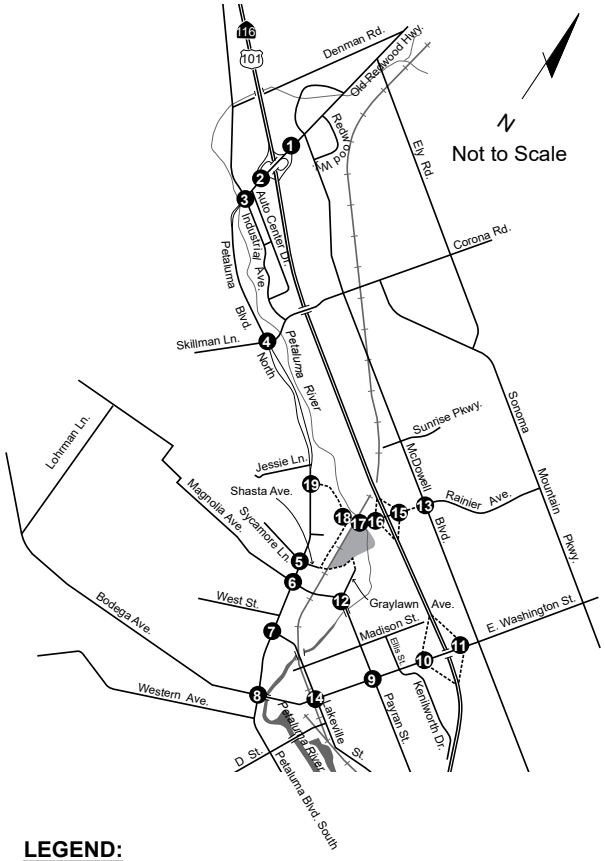
- Petaluma Boulevard North/Corona Road,
- Petaluma Boulevard/Washington Street, and
- East Washington Street/Lakeville Street

Cumulative Plus Project Intersection Level of Service

The Cumulative plus Project scenario represents the projected future traffic conditions at study area intersections based on General Plan build-out, plus the addition of traffic generated by the Project. Trips associated with the Project were added onto the Cumulative scenario described above. The cumulative scenario includes the Rainier Avenue Extension/Interchange roadway network improvements and the Shasta Extension to Rainier, as described for the Cumulative scenario. Intersection operations under the Cumulative plus Project scenario were analyzed based on the peak hour intersection turning movement volumes shown in **Figures 14-14A and -14B**.

Table 14-11 presents the results of this analysis, with detailed calculations presented in the Appendix.

[19] As presented in the *Rainier Cross-Town Connector Draft EIR* (prepared by URS Corporation, July 2014), the extension of Rainier Avenue to Petaluma Boulevard North would improve traffic conditions throughout the City of Petaluma; however, it would also have an isolated intersection impact to traffic conditions on Petaluma Boulevard North. The exact location (intersection) of the impact would depend on the construction timing of the Shasta Avenue extension to Rainier. If the Shasta Avenue extension to Rainier is constructed during the buildout of the General Plan (as assumed in this EIR's analysis) then the project could potentially have an impact at the Petaluma Boulevard North/Sycamore Lane (Shasta Avenue) extension depending on the intersection configuration that is constructed as part of the Shasta Avenue extension to Rainier. The *Rainier Cross-Town Connector DEIR* requires as a mitigation measure for the Rainier Cross-Town Connector Project that the existing westbound approach to Petaluma Boulevard North/Sycamore Lane (Shasta Avenue) is restriped to provide an exclusive left-turn lane and a shared left/through/right-turn lane plus an exclusive northbound right-turn lane, which would improve the intersection to LOS C in the PM peak hour.



LEGEND:

- ---------- = Future Roadway (approx. location)
- ❶ = Study Intersections
- XX (YY) = AM (PM)

*Intersection #17 provides access to the potential development site East of the Petaluma River, but does not connect to the proposed project.

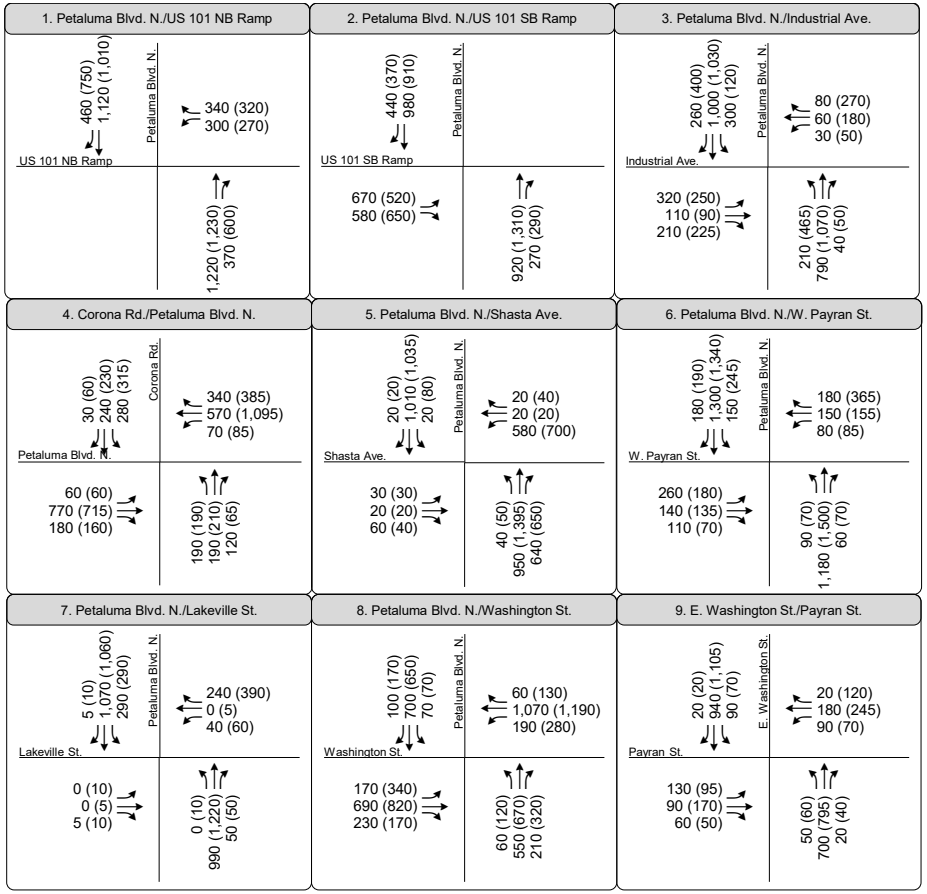
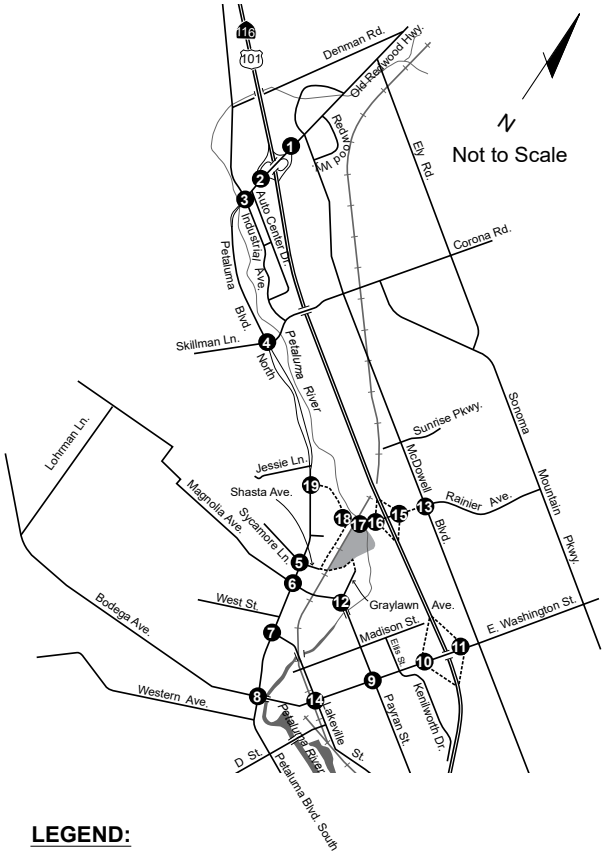


Figure 14-14A
Cumulative plus Project, with Rainier Avenue Interchange Traffic Volumes and Intersection Lane Configurations

Source: Fehr & Peers



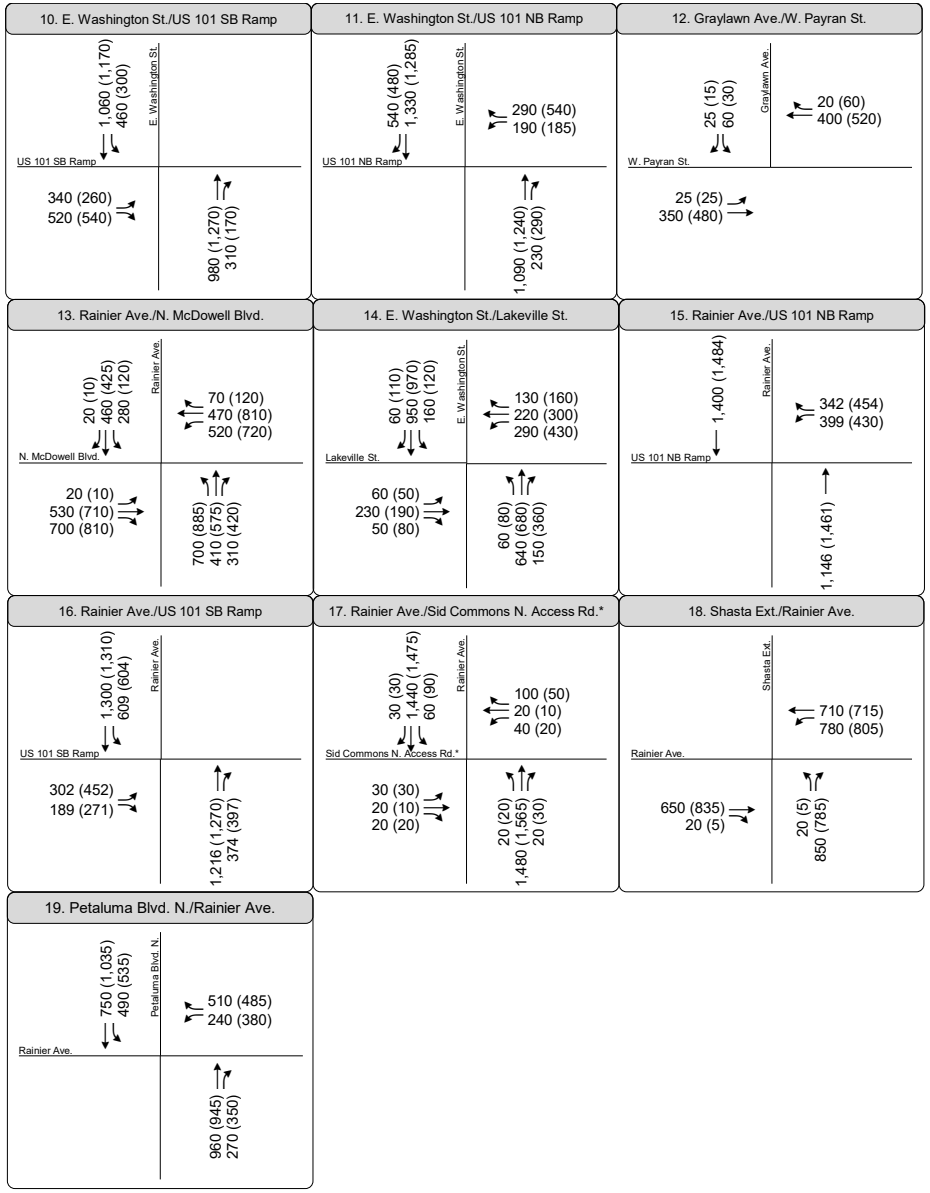


Figure 14-14B
Cumulative plus Project, with Rainier Avenue Interchange Traffic Volumes and Intersection Lane Configurations

Source: Fehr & Peers

Table 14-11: Peak Hour Intersection Levels of Service – Cumulative Plus Project Scenario

Intersection	Traffic Control	Cumulative				Cumulative Plus Project[3]			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. U.S. 101 Northbound Ramps/Old Redwood Hwy	Signalized	<10	A	<10	A	<10	A	<10	A
2. U.S. 101 Southbound Ramps/Old Redwood Hwy	Signalized	17	B	14	B	17	B	14	B
3. Petaluma Boulevard North/Stony Point	Signalized	40	D	35	D	41	D	36	D
4. Petaluma Boulevard North/Corona Road	Signalized	45	D	51	D	46	D	53	D
5. Petaluma Boulevard North/Shasta Avenue	Signalized	43	D	**>80**	**F**	48	D	**>80**	**F**
6. Petaluma Boulevard North/West Payran Street	Signalized	24	C	25	C	25	C	25	C
7. Petaluma Boulevard North/Lakeville Street	Signalized	14	B	18	B	14	B	19	B
8. Petaluma Blvd/ Washington Street	Signalized	**33**	**C**	45	D	34	C	47	D
9. East Washington Street/Payran Street	Signalized	22	C	24	C	23	C	25	C
10. East Washington Street/U.S. 101 Southbound Ramps	Signalized	30	C	29	C	31	C	30	C
11. East Washington Street/ U.S. 101 Northbound Ramps	Signalized	<10	A	15	B	10	B	16	B
12. West Payran Street/Graylawn Avenue	Side-Street Stop	15	B	18	C	22	C	24	C
13. North McDowell Boulevard/Rainier Avenue	Signalized	42	D	**75**	**E**	42	D	**78**	**E**
14. East Washington Street/Lakeville Street	Signalized	22	C	29	C	23	C	29	C
15. Rainier Avenue/U.S. 101 NB Ramps	Signalized	10	B	16	B	10	B	16	B
16. Rainier Avenue/U.S. 101 SB Ramps	Signalized	16	B	21	C	17	B	21	C

17. Rainier Avenue/Johnson North Access Road[2]	Signalized	16	B	10	B	16	B	10	B
18. Rainier Avenue/Shasta Extension	Signalized	12	B	12	B	12	B	13	B
19. Rainier Avenue/Petaluma Boulevard	Signalized	20	C	23	C	21	C	23	C

Notes:

[1] Average control delay reported in seconds per vehicle for signalized and all-way stop controlled intersections.

Average control, in seconds, of worst-case movement reported for side-street stop controlled intersections.

Intersection signal timings have been optimized to meet future demand volumes at some locations under Cumulative and Cumulative Plus Project conditions

[2] Johnson North Access Road provides access to the vacant Johnson lands east of the river, but does not connect to the proposed project

[3] Proposed Project is 278 units, however Plus Project analysis uses trip generation for a 312-unit project.

LOS - level of service

Bold = unacceptable intersection operations; Shading = significant impact

The following intersection, which would operate at LOS E under the Cumulative scenario, would continue to operate at an LOS E with the addition of Project traffic. Project-generated traffic would not cause this intersection to degrade to LOS F (the threshold of significance for signalized intersections that operate at LOS E under conditions without the Project is whether the LOS deteriorates to LOS F with the addition of Project-generated traffic).

- The North McDowell Boulevard/Rainier Avenue intersection (intersection #13) would degrade from existing LOS B to LOS E during the PM peak hour under the Cumulative scenario, but would remain at LOS E during the PM peak hour when Project-generated traffic is added to the Cumulative scenario. The average delay at this intersection would increase by 3 seconds (from 75 seconds to 78 seconds) with the addition of Project-generated traffic.

The following intersection would operate at LOS F under the Cumulative scenario due to the General Plan build-out, and the Project would add at least one vehicle trip to this intersection, causing a Cumulative impact during the PM peak hour:

- The Petaluma Boulevard North/Shasta Avenue intersection (Intersection #5)

Because the Project would add at least one vehicle trip to this intersection, the Project would contribute to the Cumulative impact. All other study intersections would continue to operate at acceptable levels of service D or better under the Cumulative plus Project scenario.

Project Contribution toward Cumulatively Impacted Intersections

This significant cumulative LOS impact at intersection #5 is caused by the combined effect of multiple new developments throughout Petaluma (including the Project), and the future Rainier Avenue and Shasta Avenue roadway extensions as projected under the General Plan 2025. The percent of cumulative trips attributable to the Project are summarized in **Table 14-12**.

Table 14-12: Percent of Project Trips Attributable to Cumulative Impacts

	Project Trips		Cumulative Plus Project Volumes		Project Percent of Total Volume		Project Percent of Growth	
Intersection	AM	PM	AM	PM	AM	PM	AM	PM
5. Petaluma Boulevard North/Shasta Avenue	50	55	3,590	4,120	1.4%	1.3%	3.5%	3.6%

Notes: - Attributable percent represents the percentage of project trips to cumulative plus project with Rainier Avenue Extension and interchange traffic volumes at significantly impacted intersections.

Mitigation Measures

The following mitigation measure shall be implemented to address the Project's contribution to cumulative intersection level of service impacts:

Petaluma Boulevard/Shasta Avenue

A substantial increase in cumulative traffic will be experienced at this intersection due to the assumed construction of the Shasta Extension to Rainier, as set forth in the General Plan. The Shasta Extension to Rainier would facilitate travel between McDowell Boulevard and Petaluma Boulevard, increasing the number of vehicles and the congestion at this intersection to unacceptable LOS F conditions. Although a new Shasta Avenue collector is not a Project-related improvement, the proposed Project would add traffic to this intersection, causing a significant impact.

Mitigation Measure Transp-3: Petaluma Boulevard/Shasta Avenue. As presented in the *Rainier Cross-Town Connector Draft EIR* (prepared by URS Corporation, July 2014), restriping the existing westbound approach to Petaluma Boulevard North/Sycamore Lane (Shasta Avenue) to provide an exclusive left-turn lane and a shared left/through/right-turn lane plus an exclusive northbound right-turn lane would improve the intersection to LOS C in the PM peak hour under Cumulative Plus Project conditions.

However, this additional right-turn lane would cause the pedestrian crossing distance to increase and would cause a secondary impact to pedestrians, based on the criteria set forth in the Petaluma General Plan. To reduce impacts to pedestrians resulting from increased crossing distances, a median refuge (at least five feet wide) should be installed for pedestrians crossing Shasta Avenue at the Petaluma Boulevard intersection; these improvements are required as mitigation measures for the Rainier Cross-Town Connector Project.

If the at-grade crossing is approved by the CPUC and the Project's proposed Shasta Avenue Extension is approved and constructed, the Project would contribute traffic to this cumulative impact. Therefore, in addition to applicable Traffic Impact Fees, the applicant shall make a fair share contribution towards this intersection improvement. Prior to building permit issuance, the applicant shall calculate preliminary costs associated with the intersection improvement, subject to review and approval by the City Engineer.

Resulting Level of Service

The addition of an exclusive left-turn lane and a shared left/through/right-turn lane plus an exclusive northbound right-turn lane would improve the intersection to LOS C in the PM peak hour under Cumulative plus Project conditions. The payment of fair share contributions towards the identified improvement at Petaluma Boulevard/Shasta Avenue (per Mitigation Measure Transp-3) would satisfy the Project's contribution toward mitigation for this cumulative impact. With this fair-share payment, the Project's contribution to this cumulative impact would be reduced to less than significant.

Freeway Operations

Existing plus Project – Freeway Operations

Transp-4: Project-generated traffic would not cause a freeway segment operating at LOS E or better to deteriorate to LOS F, and would not cause an increase in the amount of traffic on a freeway segment already exceeding LOS E by more than one percent of the freeway segment's design capacity. (**Less than Significant**)

The Project's contribution to freeway traffic volumes was estimated based on the Project trip distribution as presented in Figure 14-6. Based on this analysis, approximately 30 percent of Project-generated traffic is expected to use U.S. 101, with 25 percent traveling to and from destinations to the south of Washington Street and the other five percent traveling to and from destinations to the north of Old Redwood Highway during the PM peak hour. As shown in **Table 14-13**, Project traffic would not substantially increase the V/C ratio for the study area freeway segments.

Table 14-13: U.S. 101 PM Peak Hour V/C Ratio and Los Summary – Existing Plus Project Scenario

			Existing			Existing Plus Project		
Freeway Segment	Direction	Capacity[1]	Volume	V/C	LOS	Volume	V/C	LOS
Petaluma Boulevard to Lakeville Highway	NB	4,400	2,987	0.68	B	3,018	0.69	B
	SB	4,400	2,023	0.46	A	2,040	0.46	A
Lakeville Highway to Washington Street	NB	4,400	3,429	0.78	C	3,460	0.79	C
	SB	4,400	2,472	0.56	A	2,489	0.57	A
Washington Street to Old Redwood Hwy	NB	4,400	3,557	0.81	D	3,557	0.81	D
	SB	4,400	2,999	0.68	B	2,999	0.68	B

Notes: [1] Per the Petaluma General Plan, this analysis assumes 2,200 vehicles per lane
- Bold indicates unacceptable LOS by Caltrans standards.
V/C - vehicle-to-capacity ratio
LOS - level of service

Northbound freeway traffic on U.S. 101 will continue to experience congestion near capacity between Washington Street and Old Redwood Highway, while southbound traffic remains relatively uncongested

during the PM peak hour. The LOS at study segments would not change with the addition of Project trips. All freeway study segments would continue to operate at acceptable LOS D or better with the addition of Project trips, and no significant Project impacts would occur on the study area's freeway segments.

Pipeline plus Project – Freeway Operations

Transp-5: The addition of Project-generated traffic to the Pipeline scenario (without the Project) would not cause a cumulative level of service (LOS) standard established for the freeway system to be exceeded. (**Less than Significant**)

Near-Term or "Pipeline" Scenario

Near-term growth in regional freeway traffic will occur due to traffic associated with identified "Pipeline" projects in Petaluma. Pipeline project traffic was added to the existing freeway traffic volumes to capture the Pipeline scenario. The results are shown in **Table 14-14**.

Table 14-14: U.S. 101 PM Peak Hour V/C Ratio and Los Summary – Pipeline Scenario

Freeway Segment	Direction	Theoretical Capacity[1]	Existing			Pipeline		
			Volume[2]	V/C	LOS	Volume	V/C	LOS
Petaluma Boulevard to Lakeville Highway	NB	4,400	2,987	0.68	B	3,417	0.78	C
	SB	4,400	2,023	0.46	A	2,504	0.57	A
Lakeville Highway to Washington Street	NB	4,400	3,429	0.78	C	3,728	0.85	D
	SB	4,400	2,472	0.56	A	2,843	0.65	B
Washington Street to Old Redwood Hwy	NB	4,400	3,557	0.81	D	3,766	0.86	D
	SB	4,400	2,999	0.68	B	3,219	0.73	C

Notes: [1] Per the Petaluma General Plan, this analysis assumes 2,200 vehicles per lane.

[2] Existing volumes from Impact Sciences/Fehr & Peers, *Davidon/Scott Ranch Revised Draft EIR*, March 2017

- Bold indicates unacceptable LOS by Caltrans standards.

V/C - vehicle-to-capacity ratio

LOS - level of service

Under the Pipeline scenario, northbound traffic on U.S. 101 will continue to experience increases in levels of congestion, while southbound traffic remains relatively uncongested during the PM peak hour. All freeway study segments would continue to operate acceptably at LOS D or better conditions under Pipeline conditions.

Pipeline plus Project

As shown in **Table 14-15**, Project traffic would not substantially increase the V/C ratio for the study area freeway segments. Northbound freeway traffic on U.S. 101 will continue to experience increases in levels of congestion, while southbound traffic will remain relatively uncongested during the PM peak hour. The LOS at study segments would not change with the addition of Project-generated traffic.

All freeway study segments would continue to operate at acceptable freeway LOS D or better conditions with the addition of Project trips, and no significant Project impacts would occur on the study area freeway segments.

Table 14-15: U.S. 101 PM Peak Hour V/C Ratio and Los Summary – Pipeline Plus Project Scenario

Freeway Segment	Direction	Theoretical Capacity[1]	Pipeline			Pipeline Plus Project		
			Volume	V/C	LOS	Volume	V/C	LOS
Petaluma Boulevard to Lakeville Highway	NB	4,400	3,417	0.78	C	3,448	0.78	C
	SB	4,400	2,504	0.57	A	2,521	0.57	A
Lakeville Highway to Washington Street	NB	4,400	3,728	0.85	D	3,759	0.85	D
	SB	4,400	2,843	0.65	B	2,860	0.65	B
Washington Street to Old Redwood Hwy	NB	4,400	3,766	0.86	D	3,766	0.86	D
	SB	4,400	3,219	0.73	C	3,219	0.73	C

Notes: [1] Per the Petaluma General Plan, this analysis assumes 2,200 vehicles per lane.

- Bold indicates unacceptable LOS by Caltrans standards.

V/C - vehicle-to-capacity ratio

LOS - level of service

Cumulative plus Project – Freeway Operations

Transp-6: The addition of Project-generated traffic to the Cumulative scenario without the Project would not cause a cumulative level of service (LOS) standard established for the freeway system to be exceeded. (**Less than Significant**)

Cumulative Scenario

Freeway volumes are projected to increase considerably in the future. Projected growth in the region will contribute to increases in both northbound and southbound traffic. Forecasts of future freeway traffic volumes were obtained by adding the projected growth in freeway volumes from the traffic model to existing traffic volumes.

U.S. 101 Marin-Sonoma Narrows Project

The City has identified a roadway improvement project that involves widening of U.S. 101 from four to six lanes to include a new high-occupancy-vehicle (HOV) lane as part of the Marin-Sonoma Narrows

Project. This widening project is included in Tier 1 funding in the Metropolitan Transportation Commission's Regional Transportation Plan, meaning that funding is a top priority and construction is likely. Therefore, the Cumulative scenario assumes this project would be in place. Because the HOV lane is not available to all traffic during peak hours, the capacity of this lane was assumed to be one-half that of an unrestricted freeway lane, or 1,100 vehicles per lane per hour. This methodology is consistent with previous freeway analyses conducted in Petaluma and the 2000 Highway Capacity Manual, as described previously.

PM peak hour traffic volumes were analyzed, as they are greater than AM peak hour volumes. **Table 14-16** shows the estimated traffic volumes, V/C ratios, and the resulting LOS on U.S. 101 during the PM peak hour under Cumulative conditions (i.e., assuming the Rainier Avenue Extension and Interchange, and without the Project).

Table 14-16: U.S. 101 PM Peak Hour V/C Ratio and Los Summary – Cumulative Scenario

Freeway Segment	Direction	Capacity[1]	Volume	V/C	LOS
Petaluma Boulevard to Lakeville Highway	NB	5,500	4,180	0.76	C
	SB	5,500	2,850	0.52	A
Lakeville Highway to Washington Street	NB	5,500	4,780	0.87	D
	SB	5,500	3,610	0.66	B
Washington Street to Rainier Avenue	NB	5,500	4,900	0.89	D
	SB	5,500	3,980	0.72	C
Rainier Avenue to Old Redwood Highway	NB	5,500	4,660	0.85	D
	SB	5,500	3,790	0.69	B

Notes: [1] Per the Petaluma General Plan, this analysis assumes 2,200 vehicles per lane, plus ½ capacity (1,100) per HOV lane.
- Bold indicates unacceptable LOS by Caltrans standards.
V/C - vehicle-to-capacity ratio
LOS - level of service

With the construction of the U.S. 101 Marin-Sonoma Narrows Project, all freeway segments in the study area would operate at LOS D or better under cumulative conditions despite a growth in regional traffic conditions. This includes the new freeway segment created with the Rainier Avenue Cross-Town Connector and interchange, which would operate acceptably in both the northbound and southbound directions. The cumulative freeway mainline results are consistent with results found in the Rainier Cross-Town Connector Draft EIR.[20]

[20] City of Petaluma, *Rainier Cross-Town Connector Draft EIR*, prepared by URS Corporation, July 2014

Cumulative plus Project

The Project's contribution to freeway traffic volumes was estimated based on Project trip distribution and assignment assuming the Rainier Avenue Cross-Town Connector and Interchange improvements are in place. The Project-generated trips were added to the Cumulative traffic forecasts. The traffic volumes during the PM peak hour, the V/C ratio, and LOS under the Cumulative plus Project scenario are summarized in **Table 14-17**.

As shown, the proposed Project traffic would not cause study freeway segment volumes to exceed capacity under Cumulative plus Project conditions. Therefore, the Project's contribution to cumulative freeway impacts is considered less than significant.

Table 14-17: U.S. 101 PM Peak Hour V/C Ratio and LOS Summary – Cumulative Plus Project Scenario

			Cumulative			Cumulative Plus Project		
Freeway Segment	Direction	Theoretical Capacity[1]	Volume	V/C	LOS	Volume	V/C	LOS
Petaluma Boulevard to Lakeville Highway	NB	5,500	4,180	0.76	C	4,210	0.77	C
	SB	5,500	2,850	0.52	A	2,870	0.52	A
Lakeville Highway to Washington Street	NB	5,500	4,780	0.87	D	4,810	0.87	D
	SB	5,500	3,610	0.66	B	3,630	0.66	B
Washington Street to Rainier Avenue	NB	5,500	4,900	0.89	D	4,920	0.89	D
	SB	5,500	3,980	0.72	C	4,000	0.73	C
Rainier Avenue to Old Redwood Highway	NB	5,500	4,660	0.85	D	4,670	0.85	D
	SB	5,500	3,790	0.69	B	3,800	0.69	B

Notes: [1] Per the Petaluma General Plan, this analysis assumes 2,200 vehicles per lane, plus ½ capacity (1,100) per HOV lane
- Bold indicates unacceptable LOS by Caltrans standards.
V/C - vehicle-to-capacity ratio
LOS - level of service

Mitigation Measures

None needed.

Emergency Vehicle Access and Design Hazards

Transp-7: The Project would substantially increase roadway hazards and hazards for emergency vehicles accessing the Project site, due to the proposed at-grade rail crossing. (**Significant and Unavoidable for Project, LTS with no Shasta Extension**)

Proposed Access

The Project's proposed vehicle access includes roadway connections to the site via an extension of existing Graylawn Avenue, and a Shasta Extension to Graylawn from west of the SMART rail tracks that includes an at-grade crossing. With these two roadways, the Project would provide two points of vehicle ingress and egress to the Project site. Regional emergency vehicles access to the Project would be provided from Graylawn or the Shasta Extension to Graylawn and these roadways would provide direct access to other major City roadways such as Petaluma Boulevard and Washington Street. The Project site is approximately 1.5 miles from the nearest fire station, located on D Street at 2nd Street in downtown Petaluma. Emergency vehicles would be able to approach the Project site using multiple routes.

The Project also proposes a secondary means of emergency vehicle access (EVA) to the Project site via the Project site's existing approximately 32-foot wide frontage at the end of Bernice Court. Improvement of the Bernice Court frontage as proposed provide an acceptable fire apparatus roadway meeting all turning radius and turnaround requirements of the Petaluma Fire Code and would meet emergency access requirements, and would be dedicated to the City as part of the Project's Final Parcel Map.

Impacts of Project's Proposed At-Grade Rail Crossing

The Project's proposed Shasta Extension to Graylawn, as an at-grade vehicle crossing of the SMART rail tracks, is a direct and immediate safety hazard. The Petaluma Fire Department finds that site access via an at-grade rail crossing to have a higher likelihood of being blocked than does a typical street, and finds this at-grade crossing to be a threat to life and safety.[21] The Federal Railroad Administration (FRA) is the federal agency responsible for rail safety in the U.S., and the California Public Utilities Commission (CPUC) has jurisdiction over the safety of rail crossings in California. Like the conclusions of the Petaluma Fire Department, both the FRA and CPUC recognize that at-grade rail crossings present inherent hazards to the traveling public, particularly the crossings of freight or passenger main lines (such as the SMART rail line immediately adjacent to the Project site). The FRA has a goal to eliminate all at-grade vehicle crossings, and where that goal is not possible, to ensure that existing at-grade crossings afford a safe, comfortable and convenient passageway for all users. The CPUC also recommends eliminating at-grade crossings where possible, either through barricading the roadway approaches to such crossings or by developing grade-separated crossings.[22] These agencies also strongly recommend against the creation of new at-grade rail crossings, as evidenced by the CPUC letter stating CPUC staff's opposition to the proposed Shasta Extension to Graylawn crossing,[23] and correspondence with CPUC staff regarding the same.[24]

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21 Personal communication, Petaluma Fire Department, October 2014 and June 2017.

22 California Public Utilities Commission, *Pedestrian-Rail Crossings In California*, May 2008. Accessed at http://openarchitecturenetwork.org/system/files/CA_PUC_RailCrossing_Peds.pdf

23 See Appendix B of this EIR, Responses to the Notice of Preparation

24 Personal communication, David Stewart, Utilities Engineer CPUC, November 7, 2014.

The goals, recommendation and policies of those public agencies most responsible for rail safety indicate that construction of new at-grade rail crossings is a significant hazard. A few statistics and relevant facts highlight these safety concerns: [25, 26]

- In 2012, there were 1,953 rail-crossing collisions in the U.S., with 270 crossing fatalities and 917 crossing injuries.
- States with the most rail crossing collisions in 2012 were Texas and California.
- Nearly every three hours in the United States, a person or vehicle is hit by a train.
- A typical freight train traveling at 55 miles per hour requires a little over a full mile to stop.

Based on the goals, recommendation and policies of those public agencies most responsible for rail safety and the statistics regarding at-grade rail crossing safety, the Project's proposed at-grade rail crossing at the Shasta Extension to Graylawn is considered a significant safety hazard to traveling motorists, emergency responders and the rail carriers.

Mitigation Measures

The following mitigation measures are recommended to address vehicle and emergency access to the Project site at the proposed Shasta Extension to Graylawn:

Grade Separated Vehicle Bridge

Mitigation Measure Transp-7A: Grade Separated Vehicle Bridge. Acceptable vehicular and emergency access to the Project site could be provided via a grade-separated bridge crossing over the rail tracks at the Shasta Extension to Graylawn. CPUC approval of such a vehicle bridge design is required prior to construction.

At-Grade Rail Crossing Safety Improvements

If a grade-separated crossing is found infeasible, the following mitigation measures are recommended to increase safety at the proposed Shasta Extension to Graylawn rail crossing. The safety measures presented in Mitigation Measure Transp-7B are a generalized summary of safety measures presented in the Federal Highway Administration's Railroad-Highway Grade Crossing Handbook. The safety measures presented in the Grade Crossing Handbook are primarily intended to increase safety at existing highway/rail crossings, and the Handbook specifically indicates that, "generally, new grade crossings, particularly on mainline tracks, should not be permitted unless no other viable alternatives exist . . ."

Mitigation Measure Transp-7B: At-Grade Rail Crossing Safety Improvements. To improve vehicle and emergency vehicle safety at the proposed at-grade crossing at the Shasta Extension to Graylawn, the proposed crossing design shall be reviewed by a diagnostic team and undergo a detailed Engineering Study to identify the most effective and appropriate warning devices applicable for this crossing. If approved by the CPUC, the Project shall then implement all

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[25] PedSafe, a publication of the Federal Highway Administration, "Pedestrian Safety at Railroad Crossings", accessed at: http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=66

[26] Operation LifeSaver, Inc., access at http://oli.org/news/view/operation-lifesaver-notes-drop-in-2012-crossing-collisions-increase-in-pede

recommended improvements. Costs can vary widely depending on site conditions, improvements needed, and existing infrastructure. [27]

a) Federal law requires that, at a minimum, signs shall be posted at all rail crossings. The railroad cross-buck sign and other supplemental signs, potentially including advance warning signs, a "No Signal" or "Signal Ahead" sign, an advisory speed plate (if sight or geometric conditions require a speed lower than the posted speed limit), and use of YIELD or STOP signs are all types of signage that shall be considered.

b) Pavement markings shall be used to supplement the warning messages presented by the crossing signs and other supplemental signs. Pavement markings in advance of roadway/rail grade crossings shall consist of an X, the letters RR, a NO PASSING marking, as well as certain transverse lines.

c) Additional active traffic control devices should also be considered. Active control devices are those that give advance notice of the approach of a train, activated by the passage of a train over a detection circuit in the track. Active traffic control devices are supplemented with the same signs and pavement markings used for passive control, but also include:

   i. flashing light signals, including cantilevered flashing lights and LED flashing lights;

   ii. automatic gates, including four-quadrant gate systems in which the gates extend across both the approach and the departure side of roadway lanes to inhibit all traffic movements over the crossing; using roadway channelization with gates to prevent drivers from crossing the centerline pavement marking and driving around the gate; and barrier gate (movable automatic gates designed to close an approaching roadway temporarily);

   iii. horns and bells, including a warning bell used to supplement other active traffic control devices; and wayside horn systems, which consist of a horn or series of horns located at the roadway rail grade crossing and directed at oncoming motorists; and

   iv. other active devices such as active advance warning signs that provide motorists with advance warning that a train is approaching the crossing; active turn restriction signs that pre-empt nearby intersection traffic control signals at the approach of a train; and the use of pre-signals which stop traffic before it crosses the rail tracks and prevents vehicles from queuing across the grade crossing.

Resulting Level of Significance

Grade Separated Vehicle Bridge

Replacing the proposed at-grade crossing with a grade-separated bridge (per Mitigation Measure Transp-7A) will eliminate the hazards at this crossing, and would reduce vehicle and emergency vehicle safety impacts to a level of less than significant. However, this option requires CPUC approval, and can be difficult to achieve. Costs for a grade-separated bridge can be high, required right-of-way may not be available, and temporary rail service impacts may occur during construction. Because of the uncertainties associated with a grade separated bridge, and because the decision to construct a bridge is not within the jurisdiction of the City of Petaluma alone (i.e., it specifically requires CPUC approval),

[27] Ibid

implementation of this measure cannot be assured and the impact of the Project as proposed would remain **significant and unavoidable**.

At-Grade Rail Crossing Safety Improvements

Implementation of safety measures such as those identified in the FHWA's Railroad-Highway Grade Crossing Handbook and summarized in Mitigation Measure Transp-7B could reduce, but would not fully avoid vehicle safety impacts at the Shasta Extension to Graylawn crossing. The safety measures identified in the Grade Crossing Handbook are generally intended to improve safety conditions at existing rail crossings, and are not intended to promote new crossings. The Grade Crossing Handbook clearly indicates that; "new grade crossings, particularly on mainline tracks, should not be permitted, unless no other viable alternatives exist and, even in those instances, consideration should be given to closing one or more other existing crossings." Even with all identified safety measures, the decision as to whether an at-grade vehicle crossing could be implemented rests with the CPUC. Because safety impacts would not be fully avoided even with implementation of all identified measures, and because the City of Petaluma alone does not have the jurisdiction or ability to implement this measure (e.g., CPUC approval is required), the impact of the Project as proposed remains **significant and unavoidable**.

No Rail Crossing, EVA at Bernice Only

If no Shasta Avenue Extension across the rail tracks were provided, the Project would provide only one primary point of vehicle access (Graylawn Avenue), with an emergency EVA access at Bernice Court. The Bernice Court frontage would provide an acceptable fire apparatus roadway meeting all turning radius and turnaround requirements of the Petaluma Fire Code and would meet emergency access requirements. Under this scenario, no roadway hazards or hazards for emergency vehicles accessing the Project site would occur, and the impact would be less than significant (see also the discussion below, regarding use of Graylawn as the only primary means of access, and its conflict with the City's design standards for a local Residential Road).

Local Roadway Capacity

Transp-8: Under a scenario whereby a Shasta Extension to Graylawn (either an at-grade or above-grade crossing) is approved, the Project would substantially increase traffic on the existing sub-standard street section of Shasta Avenue. (**Less than Significant with Mitigation**)

Project's Proposed Access Scenario

Based on the Project's trip generation assumptions presented in Table 14-6, the Project's proposed 278 residential units would generate 1,808 daily vehicle trips.[28] During the busiest portion of the day (the PM peak hour), the Project would generate 171 vehicle trips inbound and outbound from the site. Based on the trip distribution assumptions for the Project, approximately one-third of the Project's vehicle trips, or 676 daily trips would use Graylawn Avenue for ingress and egress to the site. The other approximately two-thirds of the Project's vehicle trips, or 1,132 daily trips would use the Shasta Extension to Graylawn to access the surrounding circulation network (see **Table 14-18**).

[28] The Project is proposed at 278 residential units, although the traffic analysis in this Chapter uses a trip generation for a 312-unit project in order to maintain consistency with previous analysis, which presents a more conservative (worst case) analysis than the project currently being considered.

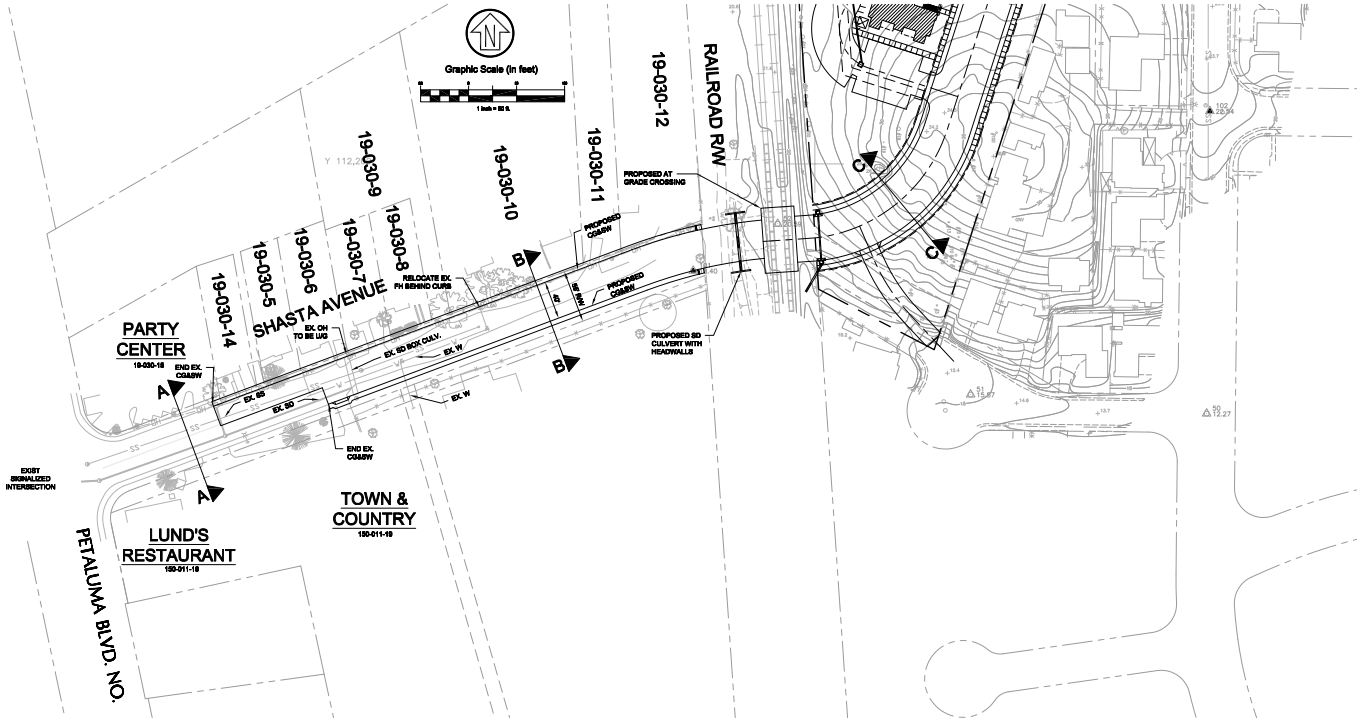
Shasta Avenue

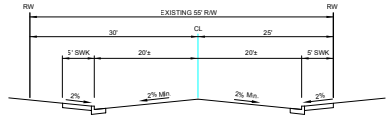
The small existing segment of Shasta Avenue between Petaluma Boulevard and the SMART rail tracks is currently a dead-end road providing access to a small number of existing residential homes, access to commercial uses at the easterly corners of Petaluma Boulevard and Shasta Avenue, and providing a rear driveway access to the shopping center to the south. For the first 150 feet from Petaluma Boulevard, Shasta Avenue is improved with three travel lanes (including a dedicated outbound left-turn lane onto Petaluma Boulevard), and curb, gutter and sidewalk along both sides of the street. The southerly side of the street, which provides driveway access to the shopping center, is improved with curb, gutter and sidewalk for a length of approximately 275 feet. Beyond that point, Shasta Avenue is an unimproved road with no lane markings and no curb, gutter or sidewalk. Shasta Avenue is identified in the General Plan as a proposed future collector road, and is specifically identified in the General Plan 2025 Mobility Report as an example of an "*unfinished street cross-section*" that "*creates opportunities to implement new street types when these streets are fully improved with curb, gutter, landscape strips and sidewalks.*"[29]

The physical condition at Shasta Avenue on the west side of the rail tracks does not meet current City of Petaluma design standards. If the Project were to add as many as 1,132 daily traffic trips to existing Shasta Avenue via the Project's proposed Shasta Extension to Graylawn, then the Project would be adding a substantial amount of traffic to an unfinished street that would not be able to accommodate this volume of traffic.

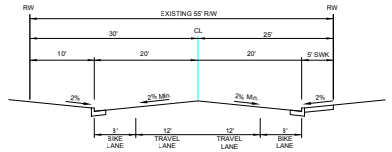
However, the Project includes a proposed improvement to Shasta Avenue on the west side of the rail tracks. These improvements include two, 12-foot travel lanes (one in each direction), 8-foot bike lanes on each side of the street, and curb, gutter and sidewalks along both sides of the street (see **Figure 14-15**). These improvement would connect to the existing improved portion of Shasta, providing a fully improved roadway section from the rail tracks to Petaluma Boulevard North.

[29] City of Petaluma, *Petaluma General Plan 2025 Mobility Report*, page 5-9, 2009

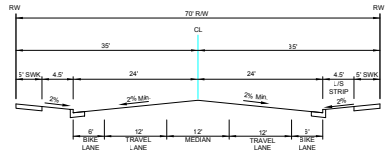




SECTION A-A
SHASTA AVENUE
EXISTING STREET SECTION
NTS



SECTION B-B
PROPOSED STREET SECTION SHASTA AVENUE
BETWEEN RAILROAD AND PETALUMA BLVD.
NTS



SECTION C-C
PROPOSED STREET SECTION
STANDARD PETALUMA COLLECTOR STREET
NTS

Figure 14-15
Proposed Shasta Avenue Connection

Source: CSW/Stuber-Stroeh Engineering Group

Graylawn Avenue, with Shasta Extension

Assuming a Shasta Avenue Extension is ultimately approved, the Project would add approximately 676 vehicle trips to Graylawn Avenue. Based on roadway counts collected in November 2015, Graylawn Avenue currently carries 954 vehicle trips per day. With the addition of Project-generated traffic, there would be a resulting 1,630 vehicle trips using Graylawn Avenue on an average day. According to the Petaluma General Plan 2025 Mobility Report, Graylawn Avenue is identified as a local residential road. Pursuant to the Street Standards for the City of Petaluma, local residential roadways are intended to carry up to a maximum average daily traffic (ADT) of 2,000 trips, serving up to 200 dwellings.[30] Based on this assessment, the Project's additional vehicle trips would be accommodated within the 2,000 vehicle trips per day design standard for a local residential road, and the Project would not cause this standard on Graylawn Avenue to be exceeded. This conclusion presumes that the Shasta Extension to Graylawn is granted.

An additional consideration regarding the proposed Shasta Extension to Graylawn Avenue is whether other vehicles are likely to use Graylawn Avenue to travel through the Project as a shortcut between Payran Street and Petaluma Boulevard via Shasta Avenue. As shown on **Figure 14-16**, such a detour would be circuitous and unlikely to induce significant traffic demand, compared to the more direct route via Payran Street. Therefore, the Project would not add substantial cut-through vehicles to Graylawn Avenue.

Graylawn, Without Shasta Extension

Under a scenario whereby the CPUC does not permit construction of a new at-grade rail crossing at Shasta Avenue or an above-grade crossing is found infeasible, all Project-generated traffic would have only one primary means of ingress and egress, via Graylawn Avenue (see also, additional discussion under Impact Transp-7, above). If all 1,808 daily trips to and from the Project were added to the existing ADT on Graylawn, it would result in 2,762 vehicle trips per day using Graylawn Avenue.

With a total of 2,762 daily vehicles on Graylawn Avenue (approximately 1,400 in each direction), current residents living along and off of Graylawn Avenue would notice a significant increase (nearly three times as much) daily vehicle traffic. Turning movements to and from Jess Avenue, Bernice Court, Cordelia Drive, Betty Court, and the many driveways along Graylawn Avenue would experience more delay, though likely not enough to affect operations through the corridor and at these adjoining side streets to a significant level.

An intersection LOS analysis was prepared, assuming that all of the Project's 1,808 vehicle trips per day (or 143 trips during the AM peak period, and 146 trips during the PM peak period) were added to the intersection of Graylawn Avenue/Payran. This analysis concluded that this intersection currently operates at LOS B during both peak hours, and would operate at acceptable LOS C during both peak hours if all Project-generated traffic were added at this intersection. It is unlikely that the addition of all of the Project's traffic to Graylawn would result in significant vehicle operation changes for drivers along Graylawn Avenue and its other adjoining side streets. Volumes at each of these side street intersections would be lower than at the Graylawn Avenue / Payran Street intersection, which has been shown to operate acceptably with all traffic generated by the Project.

[30] City of Petaluma Department of Engineering, *Street Design and Construction Standards & Specifications*, Street Standards Design and Application Guidelines (page 3), May 1999

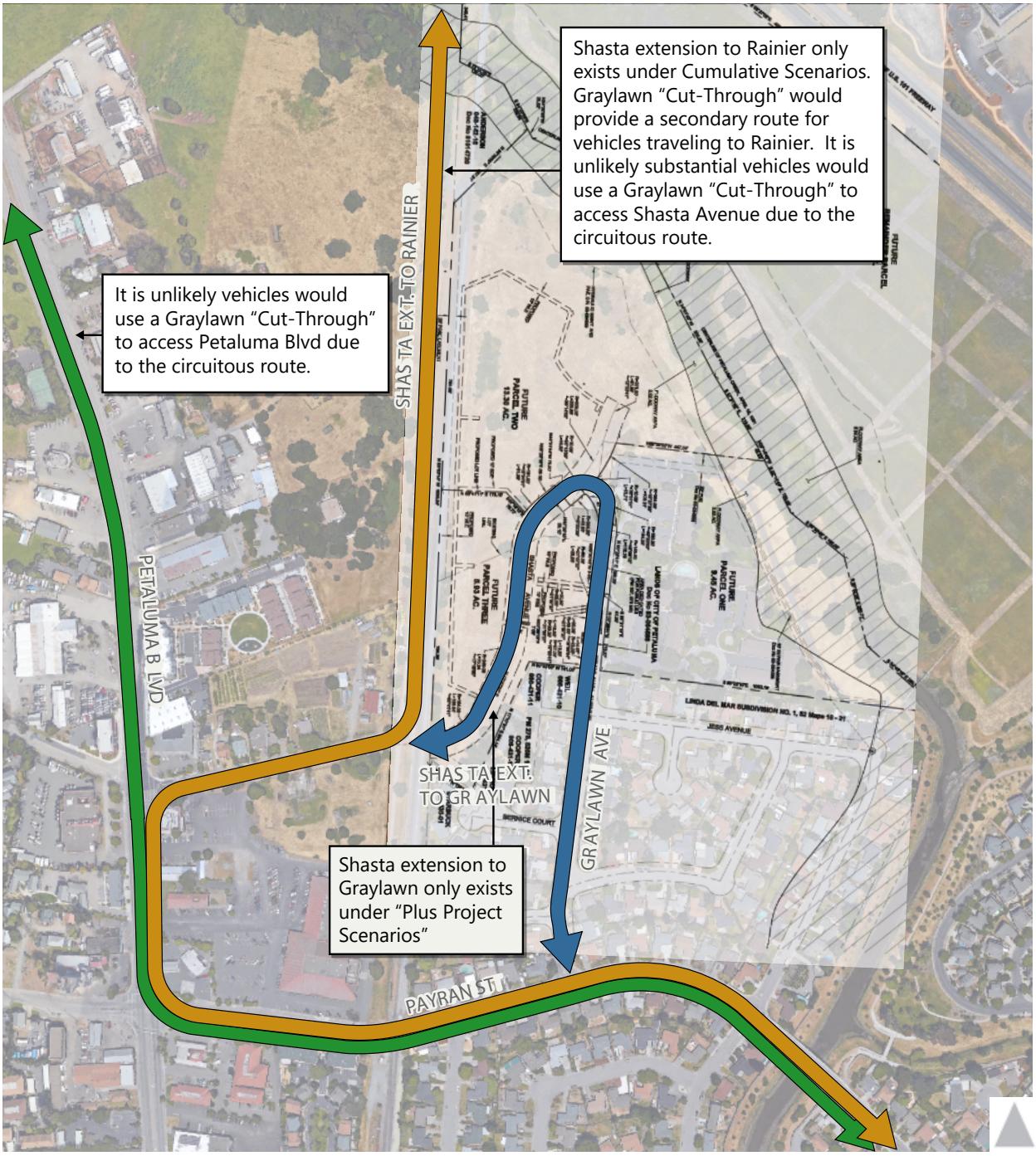


Figure 14-16
Project Site Plan and Cumulative Traffic Access

Source: Fehr & Peers

A scenario whereby the proposed Shasta Avenue Extension is not constructed and all Project-generated traffic would rely on only one primary means of ingress and egress (via Graylawn Avenue) would not result in a significant CEQA impact. This scenario would not exceed the LOS threshold at the Graylawn/ Payran intersection, and would not significantly affect turning movements at side streets along Graylawn. However, this scenario would exceed the Petaluma General Plan 2025 Mobility Report's standard daily traffic load for a local residential street. Pursuant to the Street Standards for the City of Petaluma, local residential roadways (such as Graylawn) are intended to carry up to a maximum average daily traffic (ADT) of 2,000 trips, serving up to 200 dwellings.[31] If all Project-generated traffic were to rely on Graylawn Avenue only, the total daily traffic on this roadway would be approximately 2,762 trips. The City's street standards as defined in the 2025 Mobility Report are not identified as CEQA thresholds for this EIR, but do provide a relative means of measuring the "livability" of local streets as related to increased traffic.

Table 14-18: Traffic Volumes versus Design Standards on Project Access Roadways

	With Shasta Extension to Graylawn		Without Shasta Extension to Graylawn
Scenario:	Graylawn Avenue	Shasta Avenue	Graylawn Avenue
Existing ADT	954	Very few	954
Project Contribution of ADT	676	1,132	1,808
Existing plus Project ADT	1,630	< 1,200	2,762
Exceed Design Standard?	No [1]	Yes [2]	Yes [1]

Notes: 1: Design Standard of 2,000 ADT is not used as a CEQA threshold in this EIR

2: Existing Roadway is sub-standard under existing conditions, but proposed to be improved to meet City design standards from the rail tracks to Petaluma Boulevard North

Mitigation Measures

Shasta Avenue

The following mitigation measures are required to address the Project's substantial increase in traffic on the sub-standard street section of Shasta Avenue, west of the SMART rail tracks, and build upon the Project's proposed off-site Shasta Avenue improvements.

Mitigation Measure Transp-8A: Shasta Avenue Street Improvements. If the Project's proposed at-grade rail crossing at Shasta Avenue is approved by the CPUC, the Shasta Extension to Graylawn shall include a continuation of street improvements to the existing off-site road section of Shasta Avenue, from west of the rail tracks to the intersection at Petaluma Boulevard North. The re-design shall be subject to review and approval at time of Improvement Plan review. Petaluma

[31] City of Petaluma Department of Engineering, *Street Design and Construction Standards & Specifications*, Street Standards Design and Application Guidelines (page 3), May 1999

City Staff will coordinate review of all aspects of the improvements with the appropriate review committees. Pursuant to General Plan recommendations for this roadway, the Project's off-site improvements shall re-design Shasta Avenue to include:

a) A roadway street design and construction standard that meets the City of Petaluma's standards as a collector road.

b) Improvements to the multi-modal function of Petaluma Boulevard and potentially Shasta Avenue, specifically at the intersection at Shasta/Petaluma Boulevard.

c) The introduction of pedestrian and transit amenities such as wider sidewalks, special paving treatments, bus priority treatments, landscaped medians, and street trees within parking lanes.

Resulting Level of Significance

Shasta Avenue

With the Project as proposed (including the Shasta Extension to Graylawn at-grade crossing), implementation of Mitigation Measure Transp-8A would require the Project to make off-site improvements to Shasta Avenue, such that this existing sub-standard roadway could accommodate the Project's projected traffic volume, and the impact would be mitigated to a level of less than significant.

Graylawn Avenue

Without the Shasta Extension to Graylawn rail crossing, traffic generated by the Project would only be able to use Graylawn Avenue for access to the site. Although the addition of all Project-generated trips to Graylawn Avenue would not result in a significant CEQA impact, it would add to existing traffic levels on Graylawn and exceed the City's design standards for this road.

Although not required as CEQA mitigation, the following are provided as an informational option and as a traffic engineering recommendation to address conflicts with the City's 2,000 ADT design standard for Graylawn Avenue as a residential road.

Reduce Project Size to Fit Graylawn Capacity. If the Project were to be reduced in size to approximately 149 residential units, it would produce approximately 1,046 daily trips, 78 AM peak hour trips, and 100 PM peak hour trips.[32] This number of additional trips could be accommodated, in addition to the existing 954 daily trips currently on this roadways, such that the total daily traffic would not exceed the City of Petaluma Department of Engineering's Street Standard Design (see also the Alternatives chapter of this EIR for further discussion).

Introduce Traffic Calming and Enhance Livability along Graylawn Avenue. The Project shall provide bulb outs, street tree planting, pavement marking, and other roadway livability improvements and traffic calming features to ensure that Graylawn is improved in a manner that minimize conflicts with exceedance of the 2,000 vehicle trips per day design standard.

[32] Based on the Institute of Transportation Engineer's (ITE) "fitted curve" equation for multi-family units

Pedestrian and Bicycle Circulation

Transp-9: The Project would create an inconsistency with adopted bicycle and pedestrian system plans, guidelines, policies and standards of the City of Petaluma. (**Significant and Unavoidable for Project, Less than Significant with Mitigation under No Shasta Extension scenario**)

The Project includes many elements of a comprehensive pedestrian and bicycle circulation system that are consistent with the City of Petaluma's General Plan 2025 Mobility Report recommendations. However, the Project's proposed Shasta Extension to Graylawn as an at-grade crossing of the SMART rail tracks is in direct conflict with the Mobility Report's Goal 5P-50, which states;

> "*Maintain the Northwestern Pacific Railroad (SMART) corridor for mobility purposes, and ensure that any future projects adjacent to or near the rail corridor be planned with safety of the rail corridor in mind, especially with regard to pedestrian and vehicle circulation. Design treatments should include appropriate fencing, improvements to existing at-grade crossings, and coordination with the California Public Utilities Commission (PUC)*."

These issues are further discussed below.

Pedestrian and Bicycle Elements of the Project

Pedestrian Facilities

Sidewalks exist along the Oak Creek Apartment (east) side of Graylawn Avenue, along the west side of Graylawn up to the Project site, and on both sides of Payran Avenue. These sidewalks provide existing connections to other major City of Petaluma sidewalks and open space trails. No pedestrian facilities currently exist along the Project site's frontage on Graylawn Avenue, although a worn dirt path provides a well-used trail. The Petaluma General Plan identifies the need for new multi-use pathways along the SMART tracks and along the Petaluma River. The Project would not disrupt any of these existing or proposed pedestrian facilities, and would provide for the following additions to the pedestrian system:

- A new sidewalk would be constructed along the Project's frontage of Graylawn Avenue, and would be continued into the Project site as part of the Graylawn extension. This would enhance pedestrian connectivity between the Project site and Graylawn Avenue and Payran Street, and provide enhanced access to local schools and shopping centers.
- The Project would also construct sidewalks along the Shasta Extension to Graylawn, both within the Project site and at the proposed Shasta Extension rail crossing, providing direct pedestrian access to destinations on Petaluma Boulevard and to the proposed SMART multi-use pathway on the west side of the tracks (which would not be accessible without an at-grade crossing from the Project site). The City's Mobility Plan does not consider Shasta Avenue as part of the Pedestrian District, but existing Shasta Avenue (off-site on the west side of the rail tracks) is used as an example of an unfinished street section where new street types that include landscaping strips and sidewalks should be implemented.[33]
- The Project also includes construction of a Class I multi-use bicycle/pedestrian path along its frontage of the Petaluma River, from the existing path's terminus at the Oak Creek Apartments to the northwesterly Project site boundary near the east side of the SMART rail tracks.

[33] City of Petaluma *General Plan Final Draft*, March 2008, page 5-9.

The City's Mobility Report defines a goal to "preserve and enhance pedestrian connectivity in existing neighborhoods, and require a well-connected pedestrian network linking new and existing developments to adjacent land uses." The Mobility Report also indicates that a Project would create a significant impact if it does not provide good pedestrian and bicycle linkages internal to the Project and connecting to adjacent facilities. The Project's proposal to achieve this goal and provide adequate pedestrian connections is by connecting new pedestrian facilities to the existing sidewalks along Graylawn Avenue, Shasta Avenue and to the multi-use path along the Petaluma River.

Bicycle Facilities

The bicycle facilities located near the Project site include the Class II bike lane on a short segment on Payran Street immediately east of Petaluma Boulevard, the Class III bike route on Payran Street between the Petaluma River and East Washington Street, the Class II bike lanes on Petaluma Boulevard north of Shasta Avenue, and the Class I off-street bike path along the western bank Petaluma River, beginning at Payran Street and ending at the Oak Creek Apartments, just south of the Project site. A bike path on the eastern side of the river extends from Lakeville Street and crosses under U.S. 101 where it connects to a path along McDowell Boulevard, and is known as the Lynch Creek Trail. Development of the Project would not disrupt these existing facilities.

However, the City's Mobility Report indicates that several bicycle facilities are planned near the site.[34] These planned facilities include a Class I bike path along the rail tracks on the westerly side of the Project site (which would require a rail crossing to reach), and a Class I bike path along the Petaluma River.

The Project includes the following bicycle improvement, consistent with the Mobility Report:

- Construction of a Class I bicycle and pedestrian path along its frontage of the Petaluma River, from the existing path's terminus at the Oak Creek Apartments, to the westerly Project site boundary on the east side of the SMART rail tracks.

The Project also proposes to provide Class II bicycle lanes on both sides of its proposed Shasta Extension to Graylawn roadway, both on the site and at the eastern end of the existing Shasta Avenue roadway (see prior Figure 14-15). Bike lanes on Shasta Avenue are not identified as a planned bicycle facility in the City's Mobility Report, but would enhance connectivity to Petaluma Boulevard and to the Class I trail along the Petaluma River. However, a Shasta Avenue Extension to Graylawn (with bike lanes or not) would add a roadway crossing of the Class I bike path planned along the westerly side of the rail tracks, and could potentially interfere with these planned bicycle facilities.

Pedestrian and Bicycle Impacts

Safety at Rail Crossing

The Federal Railroad Administration (FRA) is a federal agency responsible for rail safety in the U.S., and the California Public Utilities Commission (CPUC) has jurisdiction over the safety of rail crossings in California. Both the FRA and CPUC recognize that at-grade rail crossings present inherent hazards to the public, particularly pedestrian crossings of freight or passenger main lines. One of the goals within the FRA has been to eliminate all at-grade crossings, and when that goal is not possible, to ensure that existing at-grade crossings afford a safe, comfortable and convenient passageway for all users. CPUC

[34] City of Petaluma, General Plan 2025, Chapter 5: Mobility Report, 2008

also recommends eliminating at-grade crossings where possible, either through barricading the roadway/pathway approaches to such crossings, or by developing grade-separated crossings.[35] These agencies also strongly recommend against the creation of new at-grade rail crossings, as evidenced by the CPUC letter stating CPUC staff's opposition to the proposed Shasta Extension to Graylawn at-grade crossing.[36]

The goals, recommendations and policies of those public agencies most responsible for rail safety all indicate that construction of new at-grade rail crossings is a significant hazard to pedestrians, bicyclists, motorists and the rail carriers. A few statistics and relevant facts highlight these safety concerns:[37, 38]

- In 2012 throughout the U.S. there were 442 fatalities to persons trespassing on railroad tracks, and 405 trespass injuries.
- States with the most pedestrian-train casualties (deaths and injuries combined) in 2012 were California and Texas.
- Nearly every three hours in the United States, a person or vehicle is hit by a train.
- Railroad crossings present safety issues for pedestrians, particularly those using wheeled devices such as wheelchairs and scooters. They also pose a serious risk to pedestrians using headphones and/or who are hearing impaired.

Based on the goals, recommendation and policies of those public agencies most responsible for rail safety, and the statistics regarding at-grade rail crossing safety, the Project's proposed at-grade rail crossing at the Shasta Extension to Graylawn represents a significant safety hazard to pedestrians and bicyclists, result in unsafe pedestrian and/or bicycle traffic flow patterns, and is in conflict with the Petaluma General Plan 2025 Mobility Report's goals and policies.

Walking Distances

Without the Shasta Extension to Graylawn and its rail crossing, the walk from the Project to the nearest retail and transit facilities (which are along Petaluma Boulevard) would be approximately one-half mile via Graylawn Avenue and Payran Street. Based on the General Plan 2025 Mobility Report's goals and policies, walking distance greater than one-quarter mile (approximately a five to 10-minute walk) from a residential neighborhood to a retail center or transit are undesirable. Without the rail crossing at the Shasta Extension to Graylawn, walking distance from the Project site to retail and transit services would be approximately one-half mile, and would require pedestrians from the Project to cross the rail tracks at Payran Street. The existing Payran/SMART railroad at-grade crossing has been improved to minimal safety and ADA standards, with sidewalks and crosswalk striping on both sides of the street. The proposed Shasta to Graylawn Extension, has the potential to introduce another at-grade crossing which could result in unsafe pedestrian and/or bicycle conditions, which would be inconsistent with adopted pedestrian and bicycle system plans, guidelines or standards for desirable walking distances to retail and

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[35] California Public Utilities Commission, *Pedestrian-Rail Crossings In California*, May 2008. Accessed at http://openarchitecturenetwork.org/system/files/CA_PUC_RailCrossing_Peds.pdf

[36] See Appendix B of this EIR, Responses to the Notice of Preparation

[37] PedSafe, a publication of the Federal Highway Administration, "Pedestrian Safety at Railroad Crossings", accessed at: http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=66

[38] Operation LifeSaver, Inc., access at http://oli.org/news/view/operation-lifesaver-notes-drop-in-2012-crossing-collisions-increase-in-pede

transit services, specifically exceeding the transit accessibility standards for transit riders (defined as within one-quarter mile of a transit stop).

Mitigation Measures

The following mitigation measures shall be implemented to address unsafe pedestrian and bicycle access to the Project site at the proposed Shasta Avenue crossing:

Grade Separated Bridge

Mitigation Measure Transp-9A: Grade Separated Bridge. Acceptable pedestrian and bicycle access to the Project site could potentially be provided via a grade-separated bridge crossing over the rail tracks at the Shasta Extension to Graylawn (similar to Mitigation Measure Transp-8A). CPUC approval of such a bridge design is required prior to construction.

At-Grade Rail Crossing Safety

Without a grade-separated facility, the following mitigation measures shall be implemented to increase safety at the proposed Shasta Extension to Graylawn rail crossing. The safety measures presented below in Mitigation Measure Transp-9B are a generalized summary of safety measures presented in the Federal Highway Administration's *Railroad-Highway Grade Crossing Handbook* (see examples of these improvements on **Figures 14-17 and 14-18**). However, the safety measures presented in the *Grade Crossing Handbook* are primarily intended to increase safety at existing highway/rail crossings, and the Handbook specifically indicates that, "generally, new grade crossings, particularly on mainline tracks, should not be permitted unless no other viable alternatives exist . . ."[39]

[39] U.S. Department of Transportation, Federal Highway Administration; *Railroad-Highway Grade Crossing Handbook*, Revised Second Edition, 2007

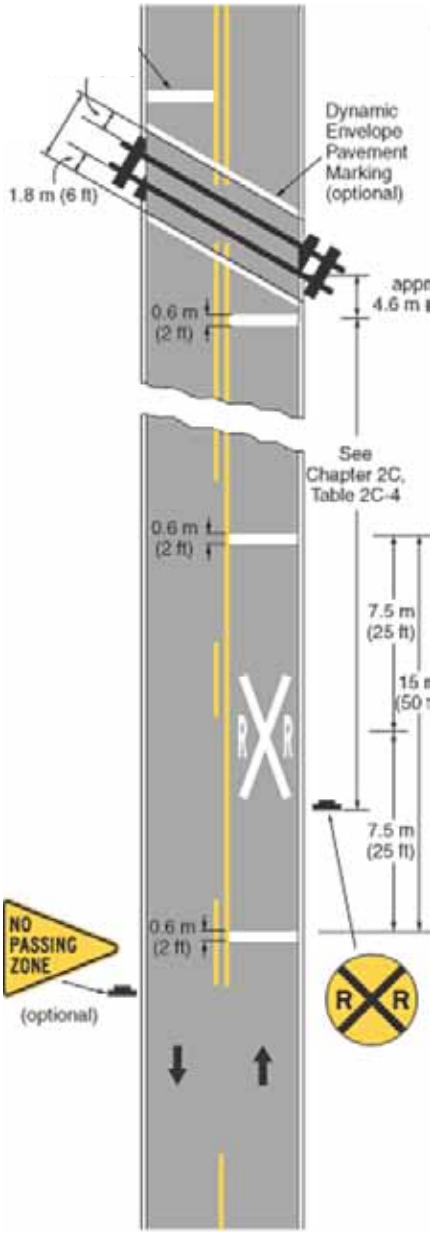

Figure 14-17
Example At-Grade Rail Crossing Safety Improvements, Pavement Markings and Pedestrian Safety Measures

Source: Federal Highway Administration, "*Pedestrian Safety at Railroad Crossings*", and FHWA, *Railroad-Highway Grade Crossing Handbook*

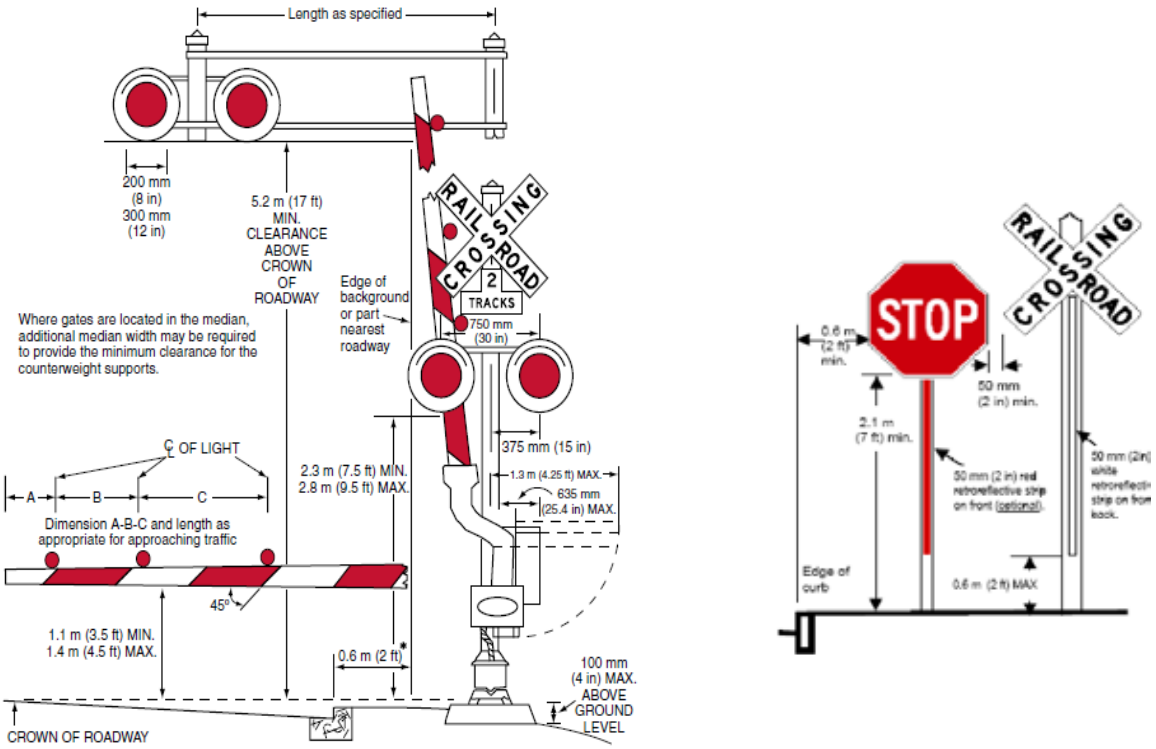

Figure 14-18
Example At-Grade Rail Crossing Safety Improvements, Signs and Signals

Source: US Department of Transportation, Federal Highway Administration, *Railroad-Highway Grade Crossing Handbook*, 2007

Mitigation Measure Transp-9B: At-Grade Rail Crossing Safety Measures. To improve pedestrian and bicycle safety at the proposed Shasta Extension to Graylawn at-grade crossing, the Project Sponsor shall fund a detailed Engineering Study of the proposed crossing, subject to review and approval of the City Engineer, to identify the most effective and appropriate warning devices applicable for this crossing. If the at-grade crossing is ultimately approved by the CPUC and the City of Petaluma, the Project shall then implement the recommended improvements. Costs can vary widely depending on site conditions, improvements needed, and existing infrastructure.

a) The pedestrian/bicycle crossings should be designed to minimize the time required for pedestrians to cross, by designing the crossings so that the pedestrian paths of travel intersect the railroad track at a 90-degree angle.

b) A number of passive pedestrian safety improvements should be considered for this crossing, and if approved, implemented. These passive measures may include, but are not limited to:

   i. Fencing and channelization;

   ii. swing gates and pedestrian barriers;

   iii. pavement markings, texturing and refuge areas;

   iv. fixed message signs;

   v. raising the approaches to the track and the area between the tracks to the level of the top of the rail, creating flat level areas to cross; and

   vi. minimizing problems with the flangeway gap width with approved flangeway filler.

c) A number of active pedestrian safety improvements should also be considered for this crossing, and if approved, implemented. These active measures may include, but are not limited to:

   i. Flashers and audible active warning devices;

   ii. automated pedestrian gates and pedestrian signals;

   iii. variable message signs; and

   iv. use of railroad crossing “cross-buck” signs.

d) A combination of audible and visual devices should be used to serve the accessibility needs of hearing-impaired and visually impaired pedestrians.

e) The implementation of pedestrian safety improvements should be accompanied by education to all Project area residents and neighbors through public service announcements, educational initiatives, school presentations, posting of all rail safety laws, etc., all sponsored by the Project applicant.

Rail Crossing Safety Measures at Payran Avenue

In the event that neither an elevated bridge nor an at-grade crossing proves feasible, or in the event that neither is approved, the following mitigation measure is recommended to provide the Project’s residents with safe and effective pedestrian and bicycle access to retail and transit facilities:

Mitigation Measure Transp-9C: At-Grade Rail Crossing Safety Measures at Payran Avenue. To improve pedestrian and bicycle safety for Project residents and others at the existing Payran Street at-grade rail crossing, prior to Improvement Plan approval, the Project Sponsor shall fund a

detailed Engineering Study of the existing crossing to identify the most effective and appropriate warning devices applicable for this crossing. This study shall be completed under direction of the City of Petaluma and in coordination with SMART to implement the recommended improvements at this location, and to determine fair-share payments towards any additional improvements.

Shasta Avenue West Sidewalks

If the Shasta Avenue extension to Graylawn is approved, then additional pedestrian improvements will be required to improve pedestrian and bicycle access, to provide good pedestrian and bicycle linkages connecting the Project to adjacent facilities, and to provide greater consistency with the City's Mobility Report recommendations; see **Mitigation Measure Transp-8A**.

Resulting Level of Significance

Replacing the proposed at-grade crossing with a grade-separated pedestrian/bicycle crossing (per Mitigation Measure Transp-9A) will eliminate the majority of hazards at this crossing, and would reduce pedestrian and bicycle safety impacts to a level of less than significant. However, this option can be difficult to achieve, as grade-separation facility costs are high (creating a pedestrian overcrossing can range from $1.5 million or higher),[40] funding sources are limited, and rail service impacts would occur during construction. Because of the uncertainties associated with a grade separated pedestrian bridge, and because the decision to construct a bridge is not within the jurisdiction of the City of Petaluma alone (i.e., it specifically requires CPUC approval), implementation of this measure cannot be assured and the impact would remain **significant and unavoidable**.

If the grade-separated pedestrian/bicycle crossing proves infeasible, implementation of the at-grade crossing safety measures identified in Mitigation Measure Transp-9B could substantially reduce, but not fully avoid the unsafe pedestrian and/or bicycle traffic flow patterns at this crossing. Even with all applicable and appropriate safety measures, the decision as to whether an at-grade crossing could be implemented rests with the CPUC. Since the City of Petaluma does not have the jurisdiction or ability to implement this measure, the safety impact for pedestrian and bicycles remain **significant and unavoidable**.

Under a scenario where no rail crossing (grade separated or at-grade) at Shasta is permitted or where such is found infeasible, Project residents would have to walk beyond a typically desirable walking distance to retail or transit services via the existing rail crossing at Payran Street, and the Project would not provide good pedestrian and bicycle linkages connecting the Project to adjacent facilities. Further, the Project would increase pedestrian and/or bicycle usage at the existing Payran crossing, which has been minimally improved to contain formal sidewalks and crosswalk striping across the railway tracks. Under such a scenario, implementation of additional pedestrian and bicycle improvements at the Payran Street rail crossing would further ensure the Project's consistency with the City's Mobility Report goals and policies for pedestrian and bicycle circulation, and would reduce potential pedestrian and bicycle safety impacts to a less than significant level.

Under a scenario where a rail crossing (either grade separated or at-grade) is permitted, the Project requirement to implement pedestrian and bicycle improvements within the public right-of way to the existing unimproved portion of Shasta Avenue west of the rail tracks would provide good pedestrian and bicycle linkages connecting the Project to adjacent facilities. These improvements would also avoid

[40] http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=66

inconsistencies with adopted pedestrian or bicycle system plans and standards, and this impact would be reduced to a less than significant level.

Transit

Transp-10: The Project would not result in a significant unanticipated increase in transit patronage beyond the system's current capacity, but potentially could result in development that is not appropriately accessible to transit riders (defined as within one-quarter mile of a transit stop). (**Less than Significant**)

Given the Project's location, historical rates of transit usage in the City, and the Project's trip generation, it is expected that the Project will generate less than 50 daily transit trips and less than 10 transit trips in either peak hour.[41] Given the low transit trip generation, it can be concluded that the Project will not create a demand for transit service above the existing capacity. Based on a review of available documents, there are no planned transit services that would be impacted by the development of the Project site.

Mitigation Measures

None needed. The mitigation measures identified above (measures MM Transp-9A through -9D, depending on feasibility of the Project's proposed rail crossing) would address standards applicable to accessibility to transit stops to and from the Project site.

On-Site Circulation

Transp-11: The on-site circulation plan provides adequate design to accommodate emergency vehicles accessing and circulating within the Project site. (**Less than Significant**)

The Project would be located at the northern terminus of Graylawn Avenue, between the existing railroad tracks and the Petaluma River. The access points to the Project are via Graylawn Avenue and the proposed at-grade Shasta Extension to Graylawn from the westerly side of the SMART rail lines to the site. **Figure 14-19** provides a conceptual site plan of the Project.

[41] US Census data; 2011-2015 American Community Survey 5-Year Estimates

Figure 14-19
Project Site Plan and Internal Roadway Layout

Source: CSW Stuber Stroh Engineering, May 2017

Driveway aisles form the main components of the on-site vehicular circulation system. One drive aisle off of Graylawn Avenue and four drive aisles off of the Shasta Extension to Graylawn would provide access to the proposed residential units within the Project, and provide multiple entry and exit points to the Project site. A circular driveway off of the Shasta Extension to Graylawn would provide access to a parking area adjacent to the proposed clubhouse. All drive aisles would be unsignalized with stop-control for exiting drive aisle traffic. All turning movements would be allowed at the drive aisle intersections, with one lane of traffic entering and one lane of traffic exiting. In general, the locations and configurations of the Project's drive aisles are adequate. The Project's layout provides a desirable number of drive aisles that would serve to disperse traffic rather than concentrate access at a single location, and are designed to facilitate adequate internal circulation.

Expected truck traffic at the Project site would be from delivery-type trucks, moving vans and potential larger moving trucks, as well as large emergency vehicles (i.e., fire trucks). Truck and emergency vehicle access could occur at all major drive aisles from the Shasta Extension to Graylawn and from Graylawn Avenue. Connections between drive aisles and the internal roadway configuration are such that trucks and emergency vehicles could enter and exit the Project site without having to make a U-turn on site.

Mitigation Measures

The Project's impacts with respect to internal circulation design features would be less than significant, and no mitigation measures are required.

Construction Traffic

Transp-12: The proposed project would cause temporary disruption to the transportation network due to construction. ***(Less than Significant with Mitigation)***

Construction for the proposed project would be expected to last approximately one and one-half years, and would be required to comply with applicable City construction standards. All construction-worker parking and staging of construction equipment would occur on the Project site, and traffic generated by construction workers would occur primarily during off-peak times and would not affect the overall level of service experienced along these roadways beyond what was identified for Project conditions. The Project would require a substantial export of approximately 14,470 cubic yards of soil from the terraced grading along the Petaluma River, and this soil export would result in additional haul trucks accessing and leaving the Project site and using local roadways. City and emergency services would be notified of any roadway restrictions, alternative emergency routes, and detours due to construction. Nonetheless, additional heavy vehicle traffic would be added to the street network in the vicinity of the Project site (such as Graylawn Avenue, Payran Street, and Petaluma Boulevard), and the proposed Project would have the potential to result in potentially significant temporary impacts on the transportation network during construction such as delays due to slow moving trucks and lane closures, or damage to road pavement from truck movement. Mitigation is set forth below to address this potentially significant impact.

Mitigation Measures

The following mitigation measures are recommended to address temporary construction impacts surrounding the Project site:

Mitigation Measure Transp-13: Prepare Construction Management Plan. A construction management plan shall be prepared for review and approval by the City of Petaluma Public Works

Department. The plan shall include at least the following items:

a) Development of a construction truck route that would appear on all construction plans to limit truck and auto traffic on nearby streets.

b) Comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak traffic hours, detour signs if required, lane closure procedures if required, sidewalk closure procedures if required, cones for drivers, and designated construction access routes.

c) Evaluation of the need to provide flaggers or temporary traffic control at key intersections along the truck route(s)

d) Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures would occur

e) Location of construction staging areas for materials, equipment, and vehicles if there is insufficient staging area within the work zone of the proposed project.

f) Identification of truck routes for movement of construction vehicles that would minimize impacts on vehicular and pedestrian traffic, circulation and safety; provision for monitoring surface streets used for truck movement so that any damage and debris attributable to the proposed project's construction trucks can be identified and corrected by the proposed project applicant.

g) A process for responding to and tracking complaints pertaining to construction activity, including identification of an on-site complaint manager

h) Documentation of road pavement conditions for all routes that would be used by construction vehicles both before and after proposed project construction. Roads found to have been damaged by construction vehicles shall be repaired to the level at which they existed prior to construction of the proposed project.

Resulting Level of Significance

Implementation of Mitigation Measure TRANSP-13 would reduce the temporary construction impacts of the proposed Project to a less-than-significant level.

Parking

The Court of Appeal has held that parking is not part of the permanent physical environment, that parking conditions change over time as people change their travel patterns, and that unmet parking demand created by a project need not be considered a significant environmental impact under CEQA unless it would cause significant secondary effects.[42] Similarly, the December 2009 amendments to the State CEQA Guidelines (which became effective March 18, 2010) removed parking from the State's Environmental Checklist (Appendix G of the State CEQA Guidelines) as an environmental factor to be considered under CEQA. As such, although not required by CEQA, parking conditions are evaluated in this document as a non-CEQA topic for informational purposes.

[42] San Franciscans Upholding the Downtown Plan v. the City and County of San Francisco (2002) 102 Cal.App.4th 656.

The following analysis evaluates whether the Project's parking demand would be met by the Project's proposed parking supply.

The *City of Petaluma Zoning Ordinance* (Section 11.060, Table 11.1) requires one parking space for every "bedroom, studio, or efficiency unit" and states that, "in no case, shall a project provide an overall parking ratio of less than 1.5 spaces per unit". For the 278 unit Project, comprised of 120 one-bedroom units and 158 two-bedroom units, this parking requirement equates to 436 parking spaces. The Project's proposed site plan shows a total of 445 off-street parking spaces for both residents and visitors.

Parking demand was also estimated using *Parking Generation*, 4th Edition (Institute of Transportation Engineers, 2010). The estimated parking demand from *Parking Generation* 4th Edition for the Project is 342 spaces.[43] This demand would be accommodated by the 445 on-site parking spaces.

Finally, the *City of Petaluma Zoning Ordinance* (Section 11.090) requires one bicycle parking space for every 10 automobile parking spaces. The bicycle parking shall not be more inconveniently located than car parking and attempts should be made to ensure the bicycle parking is more convenient. Of these bicycle spaces, 60% should be bicycle lockers, another form of enclosed bicycle parking, or guarded parking and 40% should be bicycle racks covered. Therefore, the Project will provide 44 bicycle parking spaces in convenient locations throughout the site, with 26 bicycle lockers and 18 bicycle rack spaces.

The Project would meet the automobile and bicycle parking space requirement of the City's zoning and the demand as calculated by ITE parking rates. Thus, the proposed Project's parking supply would be adequate. Additionally, all parking stall dimensions shall be in conformance with the standards required by the City's Site Plan and Architectural Review Guidelines: Parking Standards.

[43] Low to Mid-Rise Apartment (ITE Land Use 221) in suburban settings has an average weekday peak parking demand of 1.23 vehicles per dwelling unit. For the 278 units, this results in 342 spaces for the peak parking demand.

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Utilities

The following chapter of this EIR provides an analysis of potential impacts resulting from implementation of the Project on the City's public utilities and utility services, including its water supply, wastewater treatment capacity, storm drainage system capacity, and solid waste disposal.

Environmental Setting

Water Supply

Water Supply Sources

The Petaluma Water Resources and Conservation Division of the Department of Public Works and Utilities is the water purveyor for the City of Petaluma. Petaluma's primary source of water is Russian River water purchased from the Sonoma County Water Agency (SCWA). The SCWA supplies water to Petaluma and seven other water contractors under the Restructured Agreement for Water Supply between SCWA and its contractors. Under this Restructured Agreement, Petaluma's monthly water supply entitlement from the SCWA is an average day maximum monthly (ADMM) supply of 21.8 million gallons per day (mgd) and an annual supply limit of 13,400 acre-feet per year (or 4,366 million gallons).

Beyond the water provided by the SCWA, the only potable water source currently available to the City of Petaluma is City-owned groundwater wells. The City maintains a groundwater supply system that is reserved for standby or emergency situations, or to provide peak day demand that cannot be met through SCWA water. Although groundwater wells have been used in past years to supplement the SCWA supply during peak summer months, the use of wells for supply into the City's potable water supply system was discontinued due to customer complaints about the aesthetic quality of the water. The City wells are currently used only for irrigation of some City-owned parks and the airport. The City well capacity is reserved for emergency/backup supply.

Petaluma also implements a water conservation program. Beginning in 1999, the City's water conservation program focused primarily on implementation of best management practices (BMPs) identified by the California Urban Water Conservation Council. Through the period from 1999 to 2005, the City's efforts provided potable water savings of about 1,216 acre-feet.[1] In 2008, the City adopted its Water Conservation Plan, with the goal of implementing further, cost-effective and reasonable water conservation measures. The Water Conservation Plan includes numerous conservation strategies intended to result in a potable water offset that exceed the goal of 495 million gallons per year (or 1,520 acre-feet per year).

In addition to water conservation, the City of Petaluma reduces demand for potable water through use of recycled water. In 2009, the City completed construction on the Ellis Creek Water Recycling

[1] City of Petaluma, *Water Conservation Plan*, 2008, page 2-4

Facility east of the Oakmead/Northbay Business Park and adjacent to Lakeville Highway. This facility produces tertiary-treated recycled water that meets California Department of Health Services (DHS) Title 22 requirements for unrestricted use. The Ellis Creek facility treats about 5 million gallons of wastewater each day. In the wintertime, treated wastewater is introduced back into the Petaluma River. During the summer, the recycled water is used for irrigation of agricultural lands, two golf courses and a vineyard. Petaluma's water conservation and recycled water program are estimated to save a total of approximately 2,190 acre-feet of potable water annually, and reduce peak day demands by 4.85 million gallon per day (mgd).

Water Supply/Demand

2008 Water Conservation Plan[2]

The 2008 Petaluma Water Conservation Plan included a projection of total annual potable water demands for the City of Petaluma, based on actual demands for year 2002, and projections for the years 2005, 2010, 2015, 2020 and 2025. These projections were consistent with the projections made by SCWA for the City of Petaluma during preparation of their 2005 Urban Water Management Plan. These projections indicated that the baseline year of that study (2002) had a total annual water demand of 3,623.19 mg/year (or approximately 11,120 acre-feet/year), with a projected increase to approximately 4,898.51 mg/year (or 15,033 acre-feet/year by 2020. At assumed buildout by 2025, the Water Conservation Plan projections estimated a total water demand of approximately 5,138.64 mg/year (or approximately 15,775 acre-feet per year).

Petaluma General Plan 2025

The City's General Plan 2025 also indicated that buildout through 2025 would result in a projected water demand of approximately 15,775 acre-feet. The General Plan concluded that Petaluma's contract entitlement of 13,400 acre-feet per year from SCWA alone would not be sufficient to meet the growth projected through 2025, and that by 2025 there would be an annual demand shortfall of approximately 2,371 acre-feet per year, and an average day maximum month (ADMM) demand shortfall of 5 mgd. The General Plan EIR, certified in May 2008, further reviewed the General Plan's water demand and supply estimates, and reached the different conclusion that sufficient water supplies will be available to serve the City through General Plan buildout in 2025, assuming offsets provided by increased use of recycled water and groundwater, as well as conservation.

City of Petaluma Urban Water Management Plan

The City must comply with the Urban Water Management Plan Act, which requires the preparation of an Urban Water Management Plan (UWMP) every five years. The most recent UWMP was completed for the 2015 cycle, and was adopted by the City in June 2016. The City's 2015 Urban Water Management Plan (UWMP) updated information from General Plan 2025 and extended the term of water demand analysis to 2040. The City of Petaluma's 2015 UWMP provided an updated analysis of the City's existing water supply resources and demands, including the City's contract with SCWA, the City's water recycling program (potable offset), water conservation programs and limited use of groundwater.

[2] City of Petaluma, Department of Water Resources and Conservation, "Water Conservation Plan, January 2008; accessed at: http://cityofpetaluma.net/wrcd/pdf/cop-water-conservation-master-plan-opt.pdf

Demand: Based on actual metered water accounts and use of recycled water, the 2015 UWMP identified a total 2015 potable retail water use of 6,744 acre-feet serving residential, commercial, industrial and landscape irrigation users; and a recycled retail water use for beneficial uses within the SCWA's service area of 846 acre-feet, used primarily golf course irrigation. This resulted in a total 2015 retail water use within the service area of 7,590 acre-feet.[3, 4]

The 2015 UWMP also projects a year 2020 potable retail water demand of 8,398 acre-feet to serve residential, commercial, industrial and landscape irrigation users; and a projected recycled water demand within the SCWA service area of 1,138 acre-feet, resulting in a total projected year 2020 retail water demand within the service area of 9,536 acre-feet. By year 2040, the 2015 UWMP projects a potable retail water demand of 9,623 acre-feet and a recycled water retail demand within the SCWA service area of 1,424 acre-feet, for a total retail water demand within the service area of 11,047 acre-feet.[5]

Supply: The City has historically used surface water, groundwater, and recycled water to supply its various customer demands. The City's future supply strategy relies on surface water from the SCWA and recycled water from its own water recycling facility.

The City of Petaluma purchases water from the SCWA, which is supplied by the federal Russian River Project. The City of Petaluma, along with the other SCWA contractors, signed a Restructured Agreement for Water Supply in 2006 that provides for the financing, construction, and operation of diversion facilities, transmission lines, storage tanks, booster pumps, conventional wells, and appurtenant facilities. The agreement states that the SCWA is not obligated to provide the City of Petaluma more than 13,400 acre-feet per year or more than 21.8 million gallons per day as an average daily rate during any one month.

The City of Petaluma also maintains wells that pump from the Petaluma Valley Basin, but does not rely on groundwater as a significant portion of supply due to specific yield and water quality limitations. Since 2000, groundwater is only used for peak water demand needs or to minimize short-term supply cost impacts to customer rates. In the future, the City does not project any groundwater use until a better understanding of long-term yield, water quality and treatment requirements are understood.

The City's Ellis Creek Water Recycling Facility (ECWRF) serves agricultural and industrial customers mostly located near the ECWRF, as well as urban recycled water customers such as parks, golf courses, schools, and business parks within the service area. In addition to the year 2015 retail recycled water use of 846 acre-feet, other recycled water users in 2015 included agricultural uses outside of the service area (861 acre-feet) and recycled water used within the recycled water facility (469 acre-feet), or a total use of 2,194 acre-feet of recycled water. The City is planning expansion of the recycled water system to deliver recycled water to more parks and schools throughout the service area and to deliver recycled water to more agricultural customers outside of the City's service area, with an expected increase of 657 acre-feet of recycled water to become available.

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[3] City of Petaluma, 2015 Urban Water Management Plan, Final dated June 2016, page 11 Table 4-3

[4] It is noted that 2015 was a unique year for water demands as the state was experiencing a three-year drought. The State of California mandated the City of Petaluma to reduce its water consumption by 16%, a figure in which the City was able to accomplish by increasing water conservation efforts and applying water use restriction methods.

[5] Ibid

Supply vs. Demand: The City expects that the full MOU supply volume of 13,400 AF will be available from the SCWA during normal years and during periods of multiple dry years, and as shown in **Table 15-1**, this supply is expected to be adequate to meet demands through year 2040.

Table 15-1 Normal Year Supply and Demand Comparison

	Actual 2015	2020	2040
Supply totals[1]	8,524[2]	14,538	14,824
Demand totals	7,590	9,536	11,047
Difference		+5,002	+3,777

Notes:

1. This table includes only the potable offset portion of the recycled water supply, and assumes the projected demand as supply for recycled water use within the service area. Additional recycled water is expected to be available, but will be used for out of service area agricultural use.

2. The 2015 supply consists of purchased water from the SCWA (13,400 AFY each year), pumped groundwater from City owned wells (reduced to zero in future years), and increased recycled water produced by the ECWRF.

Source: City of Petaluma, 2015 Urban Water Management Plan, June 2016, Table 7-2

During a single-dry year scenario, the City expects its supply from the SCWA to be reduced significantly, and assumes that the SCWA may only be able to supply 70% of the City's demand under such a scenario. The City may also decide to temporarily reduce its demands and supply delivery during certain future conditions to assist in addressing regional water supply and demand issues. Projected water supply and demand during a single dry year scenario are presented in **Table 15-2**.

Table 15-2: Single Dry Year Supply and Demand Comparison

	2020	2030	2040
Supply totals[1]	7,254	7,735	8,254
Demand totals[2]	9,536	10,295	11,047
Difference	-2,282	-2,560	-2,793

Notes:

1. Supply totals are based on a 30% reduction in the water demand reported to the SCWA. This assumes that the SCWA will only be able to supply 70% of the City's demand. The supply totals also include recycled water supply to meet projected recycled water demand.

2. Demand totals include potable water demand and recycled water demand.

Source: City of Petaluma, 2015 Urban Water Management Plan, June 2016 – Table 7-3

The City applies a rationing plan during declared water shortages or for catastrophic loss of water. The rationing plan determines a consumption reduction of up to and over 50 percent of the normal consumption depending on causes, severity and anticipated duration of the water supply shortage.

The City also maintains an active conservation program that include a Water Waste Prevention Ordinance that prohibits such practices as non-recirculating fountains, deliberate waste of water, single-pass evaporative cooling towers or other non-essential uses of water; water metering whereby all customers are metered and charged using volumetric rates, conservation pricing, public education and outreach, programs to assess and manage distribution system losses, water conservation program coordination and staffing support, and other demand management measures.

Sonoma County Water Agency Urban Water Management Plan

The Sonoma County Water Agency also adopted its 2015 Urban Water Management Plan in June 2016.[6] The SCWA holds four water rights permits issued by the SWRCB that authorize the SCWA to store up to 122,500 acre-feet/yr of water in Lake Mendocino and up to 245,000 acre-feet/yr of water in Lake Sonoma, and to divert or re-divert up to 180 cubic feet per second (cfs) of water from the Russian River with a limit of 75,000 acre-feet/yr.

The permits also establish minimum in-stream flow requirements for fish and wildlife protection and recreation. These minimum instream flow requirements vary based on the hydrologic classifications of normal, dry and critical water supply conditions. The evaluation of future Russian River supply availability is based upon the assumption that that proposed changes to the minimum in-stream flow requirements are implemented, and that the SCWA will obtain water rights approvals necessary to increase its total Russian River diversions to 76,000 acre-feet/yr. The SCWA has water rights and an assumed safe yield volume of 2,300 acre-feet of groundwater. The SCWA does not plan to utilize groundwater as a normal year source of supply, but rather that groundwater from Santa Rosa Plain wells will be utilized only on an as-needed basis during periods of drought.

The SCWA's surface water supply is subject to reductions during dry years. When the Lake Sonoma water volume is less than 100,000 acre-feet before July 15, a 30 percent reduction of diversions is required, as dictated by the SCWA's water rights permits.

The overall conclusion of the SCWA UWMP is that there are adequate water supplies through the 2040 planning horizon, except for single-dry years, starting after 2020. Single-dry years may require demand curtailments for some portion of the year, and in these circumstances the SCWA will work with its customers (including the City of Petaluma) to reduce water demands, to utilize additional local sources, or both. Based on efforts over the last five years during dry conditions, the SCWA does not anticipate any difficulty in maintaining an adequate water supply during the single-dry year. The magnitude of these single-dry year potential shortfalls is estimated to be about 18% of average annual demand by 2040.

Wastewater Treatment

The Ellis Creek Water Recycling Facility (WRF), which became operational in 2009, treats all wastewater generated by the City of Petaluma and the unincorporated Sonoma County community of Penngrove. The collection system is comprised of more than 190 miles of underground piping and nine (9) pump stations. The Facility's treatment capacity is about 6.7 million gallons per day average dry weather flow (ADWF). The facility currently treats approximately 5 million gallons per day. As such, there is sufficient capacity to treat additional wastewater.

[6] Sonoma County Water Agency, *Urban Water Management Plan*, prepared by Brown & Caldwell, June 2016

The WRF produces tertiary-treated recycled water which meets California Department of Health Services (DHS) Title 22 requirements for unrestricted use. The availability of tertiary-treated recycled water is an important element of the City's long-range plans for meeting water demands consistent with the General Plan 2025 buildout. During the summer, recycled water is introduced to the City's recycled water system and is used for irrigation of 800 acres of agricultural lands, two golf courses, and a vineyard. In the winter, secondary treated wastewater is conveyed to the Petaluma River.

Storm Drainage

Within the City of Petaluma, storm drains convey runoff from impervious surfaces such as streets, sidewalks, and buildings to gutters and underground storm drainpipes, which then drain to creeks and the Petaluma River, and ultimately the San Pablo Bay. The City and the Sonoma County Water Agency share maintenance responsibilities for improved stormwater conveyance facilities within the Petaluma area.

Stormwater runoff is untreated and carries with it any contaminants picked up along the way such as solvents, oils, fuels and sediment. The City has implemented a program to label storm drains to provide a visual reminder that storm drains are for rainwater only. The City's Stormwater Management and Pollution Control Ordinance, set forth in Chapter 15.8 of the City's Municipal Code, establishes the standard requirements and controls on the storm drain system. All existing and proposed development must adhere to the City's Stormwater Management and Pollution Control Ordinance, including preparation of Storm Water Pollution Prevention Plans (SWPPPs).

There is currently no storm drainage infrastructure serving the vacant Project site. Stormwater runoff from the site currently drains directly into the Petaluma River.

Solid Waste

In 2009, North Bay Corporation (Petaluma Refuse and Recycling, Inc.), assumed the City's contract for collecting solid waste from all Petaluma residential and non-residential generators, under a 10-year contract with the City of Petaluma. On average, the City generates approximately 40 to 50 tons of materials for recycling, approximately 30 tons of green waste, and approximately 100 to 130 tons of other solid waste per day. Materials for recycling are sent to the Waste Management facility in Santa Rosa, and the green waste is taken to the Sonoma Compost Company facility at the Central Disposal Site for composting. All other solid waste is taken to Waste Management's Redwood Landfill and Recycling Center, located south of Petaluma off U.S. 101 in northern Marin County.

Since 1978, the Redwood Landfill's operations have been governed by a Solid Waste Facility Permit issued by Marin County Environmental Health Services. In 1990, Redwood Landfill applied to the County for a revised permit. An EIR was prepared to analyze potential environmental impacts of the proposed permit revisions (Marin County, 1994), the FEIR was certified in 1994 and a revised permit was issued in 1995. In 1999, Marin County determined that changes that had occurred and new changes that were being proposed at the landfill necessitated another revision to the permit. Environmental review of the proposed revisions was completed in June 2008, when the County certified the Final EIR (SCH#1991033042). Subsequent permits from the California Integrated Waste Management Board, the San Francisco Bay Regional Water Quality Control Board (RWQCB) and the Bay Area Air Quality Management District (BAAQMD) were also obtained.[7]

[7] Following certification of the FEIR and approval of subsequent permits, several groups filed suit in Marin County Superior Court seeking to reverse these actions, to require additional environmental review, and

The Landfill permit ultimately approved provides an increase in total landfill capacity up to 26,077 million cubic yards, including final cover, and permits the landfill to receive the following:

- 1,390 tons per day total waste for disposal;
- 170 tons per day total material for composting;
- 400 tons per day total material for recycling; and
- 350 tons per day total cover materials.

The 2008 permit required Redwood Landfill to shift its emphasis from landfill disposal to recovery of energy and materials from waste. The 2008 permit includes conditions that direct Redwood Landfill to develop facilities that would utilize landfill gas for electricity generation, and to develop a facility to recover recyclable and reusable materials from construction and demolition debris.

In May 2013, the County issued an Addendum to the 2008 EIR,[8] specifically addressing changes that would permit development and operation of a materials recycling facility with a capacity of 400 tons per day, and modification of the existing composting facility, including use of a different composting method and increasing maximum daily acceptance of materials for composting from 170 tons per day to 514 tons per day. The Addendum also provided for an increase in the maximum daily number of vehicles entering the facility from 662 vehicles per day to 690 vehicles per day.

Regulatory Setting

Water Supply

State Regulations

California Urban Water Management Planning Act

The California Urban Water Management Planning Act[9] requires that an understanding of urban water demands and efficient use of water is to be actively pursued by water suppliers, including the requirement for every urban water supplier to periodically prepare and adopt an Urban Water Management Plan (UWMP). Each UWMP must describe the supplier's services area; identify and quantify existing and planned water sources; describe the reliability of water supplies; describe opportunities for exchanges or transfers of water; quantify past, current, and projected water use; and describe and evaluate the supplier's water demand management measures. The UWMP must be updated every five years.

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to allow appeal of certification of the FEIR to the Marin County Board of Supervisors. The case was remanded to Marin County Superior Court after a hearing before the First District Court of Appeal in March 2012 in which the court denied Petitioners' request for an appeal to the Board of Supervisors. In December 2012, the Marin County Superior Court ruled that the FEIR failed to fulfill the requirements of CEQA. In December 2014, the First District Court of Appeal in San Francisco denied the appeal and upheld the CEQA certification.

8 Marin County, Redwood Landfill Compost Facility Expansion and Materials Recovery Facility Project, Addendum to the 2008 Redwood Landfill Final Environmental Impact Report, prepared by ESA, May 2013 and accessed at: http://www.marincounty.org/~/media/files/departments/cd/planning/environmental-impact/redwoodlandfill/redwood_landfill_feir_addendum.pdf

9 Division 6, Part 2.6 of the California Water Code.

California State Senate Bill 7

Enacted in late 2009, Senate Bill 7 (SB 7) requires the State of California as a whole to achieve a 20 percent reduction in urban per capita water use by December 31, 2020. The law also requires the State to make incremental progress towards this goal, namely achieving a 10 percent per capita reduction in urban water use on or before December 31, 2015. To achieve these goals, the law includes a requirement that urban retail water suppliers would not be eligible for state water grants or loans on and after July 1, 2013, unless they demonstrate compliance with the water conservation requirements of the bill.

California State Senate Bill 610

California Senate Bill 610 (SB 610) of 2002 (codified in §10910 through §10915 of the California Water Code) requires local planning agencies to consider whether there are sufficient and reliable water supplies to serve proposed development projects of specified sizes during the application and environmental review processes for such projects. SB 610 requires an assessment of whether available water supplies are sufficient to serve the demand generated by projects, as well as the reasonably foreseeable cumulative demand in the region over the next 20 years under average normal year, single dry year, and multiple dry year conditions.

California Recycled Water in Landscaping Act

The Recycled Water in Landscaping Act requires municipalities to adopt ordinances requiring use of recycled water for landscaping uses where recycled water of appropriate quality is made available.

City of Petaluma

General Plan 2025

The Petaluma General Plan, Water Resources Element includes the goal of providing; "a safe, reliable, high-quality, economical and sustainable source of water to meet the community's needs." Policies and programs toward implementation of that goal include the following:

> **Policy 8-P-1:** Optimize the use of imported water from the SCWA to provide adequate water for present and future uses.
>
> a. Prepare, implement, and maintain long-term, comprehensive water supply plans and options in cooperation with the appropriate state and federal agencies, regional authorities, water utilities, and local governments.
>
> b. Support regional efforts towards ensuring that imported water is reliable, cost-effective, and is of high quality.
>
> **Policy 8-P-2:** Continue to work to maintain water supply agreements with SCWA to ensure adequate potable water.
>
> **Policy 8-P-3:** Work with the Sonoma County Water Agency on the South Transmission System Project to develop the parallel aqueduct along the City's preferred eastside alignment in order to improve reliability of water supplies.
>
> **Policy 8-P-4:** The City shall routinely assess its ability to meet demand for potable water.
>
> a. The City shall continue to monitor the demand for water for projected growth against actual use, and ensure that adequate water supply is in place prior to, or in conjunction with, project entitlements.

b. The City planning staff will discuss water supply with the developer for each new development early in the planning process and inform Water Resources staff of upcoming demands as provided by the applicant.

c. The City shall maintain a tiered development record to monitor pending and projected developments to allow a reasonable forecast of projected water demand.

d. The City shall upgrade utility billing software as necessary to provide the ability to efficiently track and project water demand trends.

Policy 8-P-5: Develop alternative sources of water to supplement imported supply.

a. Expand the use of recycled water to offset potable demand.

b. Expand water conservation to further improve the efficient use of potable water.

c. Continue to use groundwater to meet emergency needs.

Policy 8-P-6: The City shall utilize the Water Demand and Supply Analysis Report, June 2006 and any amendments thereto, for monitoring, assessing and improving the City's municipal water supply.

a. Require implementation of adopted Water Master Plan through conditions of approval for all public and private development.

Policy 8-P-7: Limit the provision of potable water service to lands within the Urban Growth Boundary with the exception of the provisions outlined in the Urban Growth Boundary measure and incorporated into Chapter 2 Land Use, Growth Management, and the Built Environment.

Policy 8-P-18: Reduce potable water demand through conservation measures.

a. Implement the Water Conservation Plan that incorporates conservation measures beyond the Best Management Practices developed by the California Urban Water Conservation Council.

b. Continue to expand the application of Water Conservation Best Management Practices.

c. Implement the City's Water Drought Contingency Plan to assist citizens in reducing water use during periods of water shortages and emergencies.

d. Revise the City's Landscape Ordinance to encourage, or as appropriate require, the use of water-efficient landscaping.

e. Regularly update regulations, codes and agreements to implement water conservation and discourage wasteful use of water.

f. Enforce conservation measures that eliminate or penalize wasteful uses of water.

City of Petaluma Water Conservation Regulations Ordinance

Chapter 15.17 of the Petaluma Municipal Code is the City of Petaluma's Water Conservation Regulations Ordinance. The purpose of this ordinance is to promote the efficient use and reuse of water by all city of Petaluma water service customers by requiring that all new construction projects and existing customers use water as efficiently as possible, and comply with new development standards, landscape water use efficiency standards and water waste prohibition regulations. Regulations specifically applicable to the Project include:

15.17.030 Development standards. The development standards established in this section apply to all new commercial, industrial, institutional, agricultural, single-family and multifamily residential construction, including tenant improvements or a change in use requiring any city entitlement or permit for existing commercial, industrial and institutional accounts. The development standards are intended to ensure that all installed water-using fixtures, appliances, irrigation systems, and any other water using devices apply water as efficiently as possible.

C. Standards for New Multifamily Residential Dwellings.

1. Water closets must be an approved high efficiency toilet (HET) as designated on the city's list of qualifying HETs.

2. Showerheads must not use more than two gallons per minute. Where more than one showerhead exits in a shower unit, each showerhead must be plumbed so that each showerhead can be turned on and off independently from each other.

3. Any clothes washing machine installed on the premises must have a water factor of six or lower.

4. Lavatory and/or bar faucets must not exceed 1.5 gallons per minute.

5. Kitchen and/or utility sink faucets must not exceed 2.2 gallons per minute.

6. All dishwashers must have the EPA's Energy Star label.

7. Each dwelling unit must be separately metered or sub-metered.

15.17.050 Landscape water use efficiency standards. Landscape Water Use Efficiency Standards for All New Single-Family Residential ("SFR") and Multifamily ("MFR") Residential, Commercial, Industrial and Institutional (CII) Landscape Installations. This subsection applies to all new construction projects with aggregate landscape area greater than five hundred square feet.

B. Standards Applicable to all Projects

1. For residential projects, the percentage of the residential landscape area that can be planted with high water use plants including turf shall not exceed twenty percent.

2. For nonresidential projects, the use of high water use plants including turf is limited to special landscape areas.

3. All multifamily residential and nonresidential projects must install a dedicated irrigation meter(s).

4. The maximum amount of water that can be applied to a landscape is fifty-five percent of the reference evapotranspiration rate for residential projects and forty-five percent of the evapotranspiration rate for nonresidential projects. This water allowance reduces the landscape area that can be planted with high water use plants including turf.

5. Irrigation systems are required to have pressure regulators and master shut-off valves.

6. All irrigation emission devices must meet the national standard stated in this chapter to ensure that only high efficiency sprinklers are installed.

7. The irrigation efficiency of devices used to irrigate landscapes is one of the factors that goes into determining the maximum amount of water allowed.

8. Flow sensors that detect and report high flow conditions due to broken pipes and/or popped sprinkler heads are required for landscape areas greater than five thousand square feet.

9. The minimum width of areas that can be overhead irrigated is ten feet; areas less than ten feet wide must be irrigated with subsurface drip or other technology that produces no over spray or runoff.

10. Friable soil is required in planting areas.

11. For landscape installations, four yards of compost per one thousand square feet of area must be incorporated to a depth of six inches into the soil.

12. All landscape and/or irrigation systems shall be installed so as not to violate the city's water waste prohibition (Section 15.17.070).

Water Capacity Fee

In order to implement the goals and objectives of the Petaluma General Plan, and to mitigate the impacts caused by future development in the city, certain public facilities must be constructed. The City Council has determined that, in addition to water connection and service charges, a water capacity fee is needed in order to finance public facilities required to provide water service for new development, and to provide for payment of each development's fair share of the construction and acquisition costs of such improvements needed to serve such new development.

> **19.28.030 Use of Fee Revenues**. The revenues raised by payment of the water capacity fee shall be accounted for in a capital project fund. Separate and special accounts within the fund shall be used to account for revenues, along with any interest earnings on such account. These monies shall be used for the following purposes:
>
> 1. To pay for property acquisition, including right-of-way acquisition, design, engineering, construction and acquisition of the public facilities designated in the fee resolution and reasonable costs of outside consultant studies related thereto;
>
> 2. To reimburse the city for designated public facilities constructed by the city with funds (other than gifts or grants) from other sources together with accrued interest; and
>
> 3. To reimburse the city for its costs incurred in establishing, updating, administering and maintaining the water capacity fee in accordance with Government Code Section 66013, this chapter, and other applicable law.

Wastewater

State Regulation

California Regional Water Quality Control Board - NPDES Permit No. CA0037810

The City of Petaluma's Ellis Creek Water Recycling Facility and its collection system have been classified by the U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board as a major discharger, subject to a discharge permit (NPDES No. CA0037810). The City's current discharge permit is Order No. R2-2016-0014, which was approved by the Regional Water Quality Control Board on April 13, 2016, and became effective on June 1, 2016. The permit expires on May 31, 2021. Discharge of treated wastewater at a location or in a manner different from that described below is prohibited.

- The bypass of untreated or partially treated wastewater to waters of the United States is prohibited, except as provided for in the conditions stated in Attachment D, subsections I.G.2 and I.G.4.
- The average dry weather influent flow as measured at monitoring station A-001, described in the attached MRP (Attachment E), shall not exceed 6.7 MGD. Actual average dry weather flow shall be determined for compliance with this prohibition over three consecutive dry weather months each year.
- Any sanitary sewer overflow that results in a discharge of untreated or partially treated wastewater to waters of the United States is prohibited.
- Discharge to the Petaluma River is prohibited during the dry weather period from May 1 through October 20, except when the Facility inflow exceeds the capacity of the recycled water distribution and storage system. From May 1 through October 20, the Discharger shall notify the Regional Water Board case manager by phone or email of the need to discharge immediately upon making the determination that inflow will exceed the capacity of the recycled water

distribution and storage system, and provide information supporting the determination. Unless the case manager objects within a reasonable time, the Discharger may then discharge to the extent necessary. The Discharger shall submit a report within five business days from the date of the discharge. In the report, the Discharger shall fully explain the need to discharge and provide information regarding the flow discharged, the duration of discharge, and the capacity of the recycled water distribution and storage system during this period.

City of Petaluma

General Plan 2025

The Petaluma General Plan, Water Resources Element includes the goal to "manage the wastewater collection and treatment system to address 100 percent capture and treatment of the City's wastewater in an economically and ecologically sound manner." Policies and programs toward implementation of that goal include the following:

Policy 8-P-14: The water recycling facility shall be operated and maintained in compliance with all State and Federal permit requirements.

Policy 8-P-15: Capacity of the water recycling facility shall be maintained, and expanded as necessary, to keep pace with the city's growth.

a. Require implementation of adopted Water Recycling Facility Master Plan and distribution program improvements through conditions of approval for all public and private development.

Policy 8-P-16: Comply with the current Statewide General Waste Discharge Requirements concerning the operation and maintenance of the City's sanitary sewer collection system.

a. Perform condition assessment of existing facilities.

b. Survey facilities and maintain current system maps.

c. Perform regular cleaning and inspection to help eliminate sanitary sewer overflows.

d. Fund collection system infrastructure replacement on a 100-year life cycle.

e. Regularly update the sanitary sewer flow model and make improvements necessary to support development.

Policy 8-P-17: Maintain and expand public access and educational opportunities at the Ellis Creek Water Recycling Facility.

Wastewater Capacity Fee

In order to implement the goals and objectives of the Petaluma General Plan, and to mitigate the impacts caused by future development in the city, certain public facilities must be constructed. The city council has determined that a wastewater capacity fee is needed in order to finance public facilities required to provide wastewater service for new development in the city and to provide for payment of each development's fair share of the construction and acquisition costs of such improvements needed to serve such new development. In establishing the wastewater capacity fee described in the following sections, the city council has found the fee to be consistent with its General Plan, and, pursuant to Government Code Section 65913.2, has considered the effects of the fee with respect to the city's housing needs as established in the housing element of the General Plan. (Ord. 2444 NCS §6 (part), 2012.)

Storm Drainage

State Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, Division 7 of the California Water Code, allows the SWRCB to adopt statewide water quality control plans. The purpose of the plans is to establish water quality objectives for specific water bodies. The act also authorizes the NPDES program under the CWA, which establishes water quality requirements for discharges to waters of the state. Most of the implementation of SWRCB's responsibilities is delegated to nine regional boards. The San Francisco Bay RWQCB has established permit requirements for stormwater runoff for the Project area (see Regional Regulatory Setting below).

The federal Storm Water Phase II Final Rule required operators of small municipal separate storm sewer systems (MS4s) to obtain a National Pollutant Discharge Elimination System (NPDES) permit by March 10, 2003. The Phase II Rule was the follow-up to the United States Environmental Protection Agency's (EPA) Phase I NPDES Program, promulgated in 1990 as part of the Clean Water Act. Phase I required municipalities over 100,000 to implement programs and practices to reduce pollutants in storm water runoff. The Phase II Rule requires cities between 10,000 and 100,000 to do the same. A NPDES permit is required because storm water discharges from selected cities and other institutions are considered sources of pollution. The City of Petaluma has been automatically designated to comply with the Phase II Rule by the EPA because of its population size. The City's Phase II storm water permit was updated in 2013.[10]

San Francisco Bay Regional Water Quality Control Board

The San Francisco Bay Regional Water Quality Control Board (RWQCB) governs many of the regulations associated with utilities, specifically potable water, sanitary sewers, storm drains, and recycled water. RWQCB has the authority to enforce water quality regulations found in the Clean Water Act based on the Porter-Cologne Water Quality Control Act. Wastewater discharges are guided by NPDES (National Pollutant Discharge Elimination System) permits granted by the RWQCB.

City of Petaluma

Storm Water Management Plan

To comply with NPDES permit requirements, the City of Petaluma adopted a Storm Water Management Plan in March, 2003. This plan requires the City to effectively prohibit non-stormwater discharges from entering the municipal separate storm system (MS4). The Petaluma Stormwater Management and Pollution Control ordinance enables the City to adopt requirements for the use of best management practices (BMPs) including (but not limited to) source control and post-construction treatment control measures to limit the volume, rate and potential pollutant load of stormwater runoff from new development as may be appropriate to minimize the potential generation, transport and discharge of stormwater pollutants. These requirements are to be incorporated as part of any land use entitlement or building-related permit issued by the City. Occupancy will not be authorized until the BMPs and post-construction treatment measures are properly installed, and provisions for long-term maintenance are accepted by the City.

[10] http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/phsii2012_5th/order_final.pdf

Stormwater Management and Pollution Control Ordinance

The federal Clean Water Act provides for the regulation and reduction of pollutants discharged into the waters of the United States by extending national pollutant discharge elimination system requirements to stormwater and urban runoff discharge into the city's municipal separate storm sewer system (MS4). The city's stormwater management plan requires the city to effectively prohibit non-stormwater discharges from the incorporated area of the city into the city's MS4 except as otherwise permitted by law. The following specifically pertinent provisions of the Stormwater Management and Pollution Control Ordinance apply to the Project and are necessary to implement the Stormwater Management Plan.

> **15.80.030 Purpose and intent**. The purpose and intent of this Chapter is to ensure the health, safety, and general welfare of citizens, and protect and enhance the water quality of watercourses and water bodies in a manner pursuant to and consistent with the Federal Water Pollution Control Act (33 U.S.C. Section 1251 et seq.) by reducing pollutants in stormwater discharges to the maximum extent practicable (MEP) and by prohibiting non-stormwater discharges to the city's MS4. It is the intent of the council in adopting this chapter to provide the city with the legal authority to accomplish the following goals:
>
> 1. To reduce the discharge of pollutants in stormwater to the maximum extent practicable;
>
> 2. To effectively prohibit illicit connections and non-stormwater discharges into the city's MS4;
>
> 3. To comply with the requirements of the Federal Water Pollution Control Act and the state Porter-Cologne Water Quality Control Act as they apply to the discharge of pollutants into and from the city's MS4;
>
> 4. To fully implement the city's storm-water management plan;
>
> 5. To establish the authority to adopt or impose requirements for development and redevelopment projects to reduce or eliminate stormwater pollution and erosion both during construction and after the project is complete;
>
> 6. To protect the physical integrity and function of the city's MS4 from the effects of pollutants and materials other than stormwater;
>
> 7. To prevent the contamination of ground water as a result of pollution migration from the city's MS4;
>
> 8. To protect the health and safety of maintenance personnel and the public who may be exposed to pollutants in the city's MS4;
>
> 9. To provide for the recovery of regulatory costs incurred by the city in the implementation of its stormwater management plan, including, but not limited to, enforcement activities, inspections, investigations, sampling and monitoring; and
>
> 10. To establish appropriate enforcement procedures and penalties for violations of the provisions of this chapter.
>
> **15.80.060 Prohibited discharge**. Except as provided in Section 15.80.070, no person shall discharge or cause to be discharged into the city's MS4 or watercourses any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than stormwater. (Ord. 2209 NCS §1 (part), 2005.)
>
> **15.80.070 Exceptions to discharge prohibition**. The following discharges to the city's MS4 are exempt from the otherwise applicable discharge prohibition set forth in Section 15.80.060.
>
> a. Any discharge regulated under a NPDES permit, waiver, or waste discharge order issued to the discharger and administered by the state of California under the authority of the federal environmental protection agency or under state authority, provided the discharger is in full

compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted by the city for any discharge to the city's MS4.

b. Any stormwater containing pollutants that has been reduced to the MEP by the application of BMPs or other management measures set forth in the city's stormwater management plan.

15.80.150: New development and redevelopment. The city may adopt requirements identifying appropriate BMPs including, but not limited to, source control and post construction treatment control measures to control the volume, rate, and potential pollutant load of stormwater runoff from new development and redevelopment projects as may be appropriate to minimize the generation, transport and discharge of pollutants.

a. The city shall incorporate such requirements in any land use entitlement and construction or building-related permit to be issued relative to such development or redevelopment.

b. The selection and the design of the BMPs, including post-construction treatment control measures, shall be per the city's stormwater policy and design standards and per the applicable NPDES permit issued to the city and other available guidance documents.

c. Final occupancy shall not be authorized until such time the BMPs and post-construction treatment measures are properly installed and provisions for long-term maintenance of these BMPs and treatment measures are accepted by the city. (Ord. 2209 NCS §1 (part), 2005.)

15.80.160 Responsibility to implement best management practices. Any person engaged in activities or operations, or owning facilities or property which will or may result in pollutants entering stormwater, the city's MS4, or waters of the U.S. shall implement BMPs to the maximum extent practicable to prevent and reduce such pollutants. The owner or operator of a commercial or industrial establishment shall provide reasonable protection from accidental discharge of prohibited materials or other wastes into the city's MS4 or watercourses. Facilities to prevent accidental discharge of prohibited materials or other wastes shall be provided and maintained at the owner or operator's expense.

Solid Waste

State Regulations

The California Integrated Waste Management Board is one of the six agencies under the umbrella of the California Environmental Protection Agency. Its creation, authority, and responsibilities were shaped by two pieces of legislation (AB 939 and SB 1322) signed into law as the Integrated Waste Management Act of 1989. The Act established a new approach to managing California's waste stream, the centerpiece of which mandated goals of 25 percent diversion of each city's and county's waste from disposal by 1995 (accomplished) and 50 percent diversion by 2000 (not accomplished), along with a process to ensure environmentally safe disposal of waste that could not be diverted. The statewide diversion rate started at about ten percent in 1989 and reached 37 percent in 1999 (Sonoma County PRMD, 2006).

The Integrated Waste Management Act, along with Title 14 and Chapter 15 of California's environmental regulations also provided the foundation to put the State on course to comply with federal standards (Subtitle D) for managing solid waste, including the design, construction and operation of landfills. In 1993, California became one of the first states to receive federal approval to assume authority over its solid waste activities, having exceeded the federal standards through the adoption of more stringent State regulations.

County Regulations

The Sonoma County Waste Management Agency, formed in April 1992, is the joint powers authority of the nine incorporated cities (including the City of Petaluma) and the County of Sonoma. The mission of the Agency is waste diversion required by State law AB 939. The Agency's programs include household hazardous waste, composting, wood waste recycling, planning and education, including the creation of the *Countywide Integrated Waste Management Plan*.[11] The Sonoma County 2003 Countywide Integrated Waste Management Plan (CoIWMP) sets forth solid waste planning strategies through the year 2050, and is the regional solid waste planning document for all of the nine Sonoma County cities and the unincorporated county area. The overriding mission of the CoIWMP is to "plan and implement programs to satisfy the county's solid waste management needs for the next 50 years in a manner that is cost-effective and is operated to follow the State of California's solid waste management hierarchy. The hierarchy consists of waste prevention (source reduction), reuse, recycling, composting, and disposal. Additionally, the solid waste management system for the county shall protect public health, safety, and well-being; preserve the environment; and provide for the maximum feasible conservation of natural resources and energy".

City of Petaluma

Petaluma General Plan 2025

The Community Design, Character and Green Building Element and the Natural Environment Element of the General Plan include the goal of "Providing leadership and guidance to ensure the application of sustainable site planning and green building practices." Policies and programs in furtherance of that goal include:

> **Policy 2-P-118:** As part of the Development Code and Standards Updates, incorporate sustainable site planning, development, and maintenance standards and procedures, reflecting conditions in the variety of Petaluma settings (such as hillsides and floodplains).
>
> a. Prepare, periodically update, and implement green building guidelines and/or standards, appropriate to the Petaluma context, to ensure high level of energy efficiency and reduction of life-cycle environmental impacts associated with construction and operations of buildings.
>
> b. Prepare a salvage ordinance that requires an inventory of usable materials prior to demolition.
>
> **Policy 2-P-121:** Evaluate the success of the voluntary green program and develop and implement a mandatory program for new residential, commercial and municipal development and remodels.
>
> **Policy 2-P-122:** Require development projects to prepare a Construction Phase Recycling Plan that would address the reuse and recycling of major waste materials (soil, vegetation, concrete, lumber, metal scraps, cardboard packaging, etc.) generated by any demolition activities and construction of the project.
>
> **Policy 4-P-16:** Continue to work toward reducing solid waste and increasing recycling, in compliance with the Countywide Integrated Waste Management Plan (ColWMP).
>
> **Policy 4-P-17:** Work with Sonoma County to identify environmental and economic means to meet the need for solid waste disposal.
>
> **Policy 4-P-18:** Require new or remodeled multifamily residential and all non-residential development to incorporate attractive and convenient interior and exterior storage areas for recyclables.

[11] Sonoma County Waste Management Agency, *Countywide Integrated Waste Management Plan,* 2003

Policy 4-P-19: Continue to encourage waste reduction and recycling at home and in businesses through public education programs, such as information handouts on recycling, yard waste, wood waste, and hazardous waste.

Policy 4-P-20: Consider development of a residential and commercial food waste composting program.

Policy 4-P-21: Purchase goods containing recycled materials for City use, to the extent possible.

Municipal Code Requirements

Pursuant to the Petaluma Municipal Code, Chapter 17.04, the City of Petaluma adopted Uniform Codes For Construction and Regulation of Buildings and Structures, including but not limited to the 2016 California Green Building Standards Code (CALGREEN) at the Mandatory Level for all additions and alterations, and at the Tier One level for all wholly new construction, with the exception of Appendix A4, Division A4.2, Energy Efficiency, and Appendix A5, Division A5.2, Energy Efficiency, neither of which were adopted (thus all energy components are held to the Mandatory Level). The Project will be subject to the latest CALGREEN code requirements in effect at the time of building permit:

4.408.1: Recycling. Recycle and/or salvage for reuse a minimum of 50% of the nonhazardous construction and demolition waste in accordance with either Section 4.408.2, 4.408.3 or 4.408.4; OR meet a more stringent local construction and demolition waste management ordinance.

4.408.2: Construction Waste Management Plan. Submit a construction waste management plan meeting Items 1 through 5 in Section 4.408.2. Plans shall be updated as necessary and shall be available for examination during construction.

4.408.3: Waste Management Company. Utilize a waste management company, approved by the enforcing agency, which can provide verifiable documentation that diverted construction and demolition waste materials meet the requirements in Section 4.408.1.

Impact Analysis

Standards of Significance

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Petaluma plans, policies and/or guidelines, and agency and professional standards, the Project's impact would be considered significant if it would:

1. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board
2. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects
3. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects
4. Result in exceeding water supplies available to serve the Project from existing entitlements and resources, or if new or expanded entitlements area needed
5. Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has inadequate capacity to serve the Project's projected demand in addition to the provider's existing commitments

6. Be served by a landfill with insufficient permitted capacity to accommodate the Project's solid waste disposal needs
7. Fail to comply with federal, state, and local statutes and regulations related to solid waste

Water Supply

Utilities-1: There are sufficient water supplies available to serve the Project from existing entitlements and resources, and new or expanded entitlements are not needed. The Project will add to the cumulative demand for overall water supplies, and contribute to projected dry year water shortages. Therefore, the Project will be required, pursuant to existing regulations, to include water conservation strategies that will serve to reduce overall water demands to levels projected to be sustainable on a cumulative basis, and will be subject to those water shortage contingency plans that are now in place, and as may be implemented in the future. (**Less than Significant**).

Pursuant to CEQA Guidelines section 15155 and SB 610 (Water Code, sections 10910-10915), a city or county considering a proposed residential development of more than 500 dwelling units, or a non-residential development of similar size, must request that the public water provider which would serve the development prepare and submit a Water Supply Assessment, which analyzes whether projected water supplies are sufficient to supply the development for 20 years. Since the Project, at 278 residential units, is smaller than the 500 unit threshold, a Water Supply Assessment has not been requested, nor is such an Assessment from the public water provider required. However, the following analysis has been prepared to address the CEQA threshold questions regarding adequate water supplies to serve the Project.

Average Annual Supply

The City of Petaluma's *2015 Urban Water Management Plan* identifies a per capita water demand baseline of 157 gallons per day. Using this factor, the Project (at a total population of 723) would result in an average daily water demand of approximately 113,511 gallons per day (41.4 million gallons per year, or approximately 127 acre-feet/year). This represents less than 2 percent of the total amount of potable retail water used by all residential, commercial, industrial and landscape irrigation users in 2015 (at total of 6,744 acre-feet, per the 2015 Petaluma UWMP).

The Project's water demands, in addition to existing and pipeline projects, are well within the available water supply capacity of 13,400 acre-feet/year and the peak supply limit of 21.8 million gallons per day. Tiered water rates, conservation efforts, and the conversion of Rooster Run Golf Course to recycled water have kept the City's annual retail water demands well within the available SCWA supply, at approximately 7,303 acre-feet of purchased surface water from the Sonoma County Water Agency in 2015.

Cumulative and Drought-Year Conditions

At the end of 2015, City staff had also calculated the water demands associated with all entitled proposed projects. Entitled projects were defined as approved projects that were either under construction or yet to be constructed, and proposed projects were those projects undergoing discretionary review as of December 31, 2015, and include the subject Project. When all proposed projects were added to the actual demand for year 2015, the resulting aggregate demand remained well within the available supplies as evaluated in the General Plan 2025 and the 2015 UWMP.

Therefore, there are sufficient water supplies to serve the proposed Project, and impacts to water resources would be less than significant.

Development of the Project would take place at a residential density consistent with the General Plan 2025, and the Project's water demands were included in the projection of overall City water demand as analyzed in the General Plan 2025 EIR, the City's UWMP and the County UWMP. Based on the City's assumptions regarding the future availability of water to be provided by SCWA under existing agreements, and the effectiveness of water conservation and recycling efforts, , the level of development anticipated under General Plan buildout (including the Project) would place a less than significant cumulative demand on the City of Petaluma's available water supplies. However, long-term water supply for buildout and short-term drought year supplies both rely on the continued implementation of various phases of the City's recycled water program and water conservation programs to offset potable water use. Those programs are analyzed in the General Plan 2025 and 2015 UWMP, with estimated dates for implementation dependent upon demand.

The Project will be subject to Chapter 15.17 of the Petaluma Municipal Code (the Water Conservation Regulations Ordinance), which contains water efficiency standards for all installed water-using fixtures, appliances, irrigation systems and any other water using devices to ensure that water is used as efficiently as possible throughout all new development projects. The Water Conservation Ordinance regulations also provide enforcement mechanisms and penalties for water waste, up to and including shut off of water service. Additionally, the Project will be required to pay all applicable City water impact fees to fund its share of existing water facilities and planned water facility and conservation/recycling program improvements.

Long range estimates of actual and effective water supply as provided in the City's and the County Water Agency's 2015 Urban Water Management Plan indicate that, with an assumed static supply limit from SCWA, increases in demand will be met by conservation off-sets and use of recycled water. To the extent that the SCWA is able to secure increased allocations from the Russian River, and those increased allocations may involve physical improvements to water delivery infrastructure or diversions structures, such improvements would be required to undergo separate environmental review. However, since details associated with any such improvements are not yet available, potential environmental impacts associated with those potential improvements cannot be evaluated at this time. Environmental review of such specific infrastructure improvements would be required of the SCWA at the time components of the program may be designed and formally proposed.

Mitigation Measures

None needed. With required implementation of water efficiency standards and payment of water impact fees, the Project will offset its contribution to cumulative water demands to a less than significant level.

Wastewater

Utilities-2: The Project would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board, would not necessitate construction of new or expanded wastewater treatment facilities, or result in a determination by the wastewater treatment provider that it has inadequate capacity to serve the Project's projected wastewater treatment demand in addition to existing commitments. (**Less than Significant**)

The Project, with development of 278 multi-family residential units, a clubhouse and swimming pool, would not result in a demand for wastewater treatment that would exceed the capacity of the Ellis Creek Water Recycling Facility. Assuming a population of approximately 2.6 persons per dwelling unit,[12] the Project would result in a total of 723 new people. At a rate of 125 gallons of wastewater generated per person,[13] the Project would generate a demand for approximately 90,375 gallons of wastewater treatment capacity. The WRF has a treatment capacity of about 6.7 million gallons per day, and currently treats approximately 5 million gallons per day, leaving a remaining capacity of approximately 1.7 million gallons per day. The Project's demand of 90,375 gallons per day represents approximately 5.3% of the WRF's available capacity. The WRF would have sufficient capacity to treat additional wastewater generated by the Project, would not require expansion of existing wastewater facilities that could result in significant environmental effects, and would not exceed its wastewater treatment and disposal capacity and discharge limits.

Cumulative Impacts

The Ellis Creek Water Recycling Facility has been designed, constructed and is operated to accommodate all development within the Petaluma area, as anticipated under the 2025 General Plan. The cumulative demand for wastewater collection, treatment and disposal created by the Project, in combination with that associated with other development projects that would be completed consistent with General Plan buildout, would be accommodated by the treatment plant capacity.

Mitigation Measures

None needed.

Storm Drainage Facilities

Utilities-3: The Project would not require or result in the construction of new storm water drainage facilities or the expansion of existing facilities, the construction of which could cause significant environmental effects. **(Less than Significant**)

Development of the Project would result in an increase in impervious surface, and an increase in the volume of stormwater runoff leaving the Project site (see further discussion in Chapter 9: Hydrology and Water Quality). However, because of the Project site's location immediately adjacent to the Petaluma River, stormwater runoff from the Project site would not enter the City of Petaluma's storm drainage infrastructure system. Rather, stormwater would be collected within an on-site storm drainage system and directed to two outlets from which the stormwater would enter into the Petaluma River. Potential environmental impacts related to this discharge are fully analyzed in the Hydrology and Water Quality chapter of this EIR.

All storm drainage infrastructure to be developed at the Project site would be required to comply with all provisions of the Petaluma Stormwater Management and Pollution Control Ordinance, including requirements for the preparation and implementation of a Storm Water Pollution

[12] Based on 2.60 persons per household, from Census 2010, Fact Sheet, City of Petaluma.

[13] Wastewater generation rate obtained from City of Santa Rosa sewer standards, as used in the Sanitary Sewer Calculations for the City of Petaluma's Riverfront Project Initial Study, Steven L. Lafranchi & Associates, June 2012

Prevention Plan (SWPPP) and a Stormwater Management Plan (SMP). As further discussed in the Hydrology and Water Quality chapter of this EIR, these plans must incorporate best management practices (BMPs) including, but not limited to source control and post-construction treatment control measures to limit the volume, rate and potential pollutant load of stormwater runoff from new development. These requirements are incorporated as part of all land use entitlements or building-related permits issued by the City. The City will ensure that all applicable best management practices (BMPs) and post-construction treatment measures are properly installed, and that provisions for long-term maintenance are acceptable to the City, prior to issuance of a Certificate of Occupancy (see Mitigation Measure Hydro-4A and -4B). Compliance with the provisions of the Petaluma Stormwater Management and Pollution Control Ordinance would reduce any potential impacts related to storm drainage infrastructure to a level of less than significant.

Cumulative Impacts

Stormwater runoff from the Project site would not enter the City storm drainage system, it would ultimately be directed to the Petaluma River, as would runoff from all other areas where development is proposed in Petaluma. The Project and other development projects would result in an increase in the total area of impervious surfaces within the Petaluma River watershed, and a related increase in stormwater runoff during storm events. In the absence of effective mitigation, this cumulative increase in the total area of impervious surface and stormwater runoff would be expected to have an effect on existing flood conditions. However, this Project (and all other development projects proposed in Petaluma) are required to demonstrate compliance with ongoing measures intended to reduce stormwater runoff pollution, including the retention or detention of stormwater (see further discussion of flooding impacts in the Hydrology and Water Quality chapter of this EIR).

Mitigation Measures

None needed.

Construction of New Utilities

Utilities-4: The Project would not result in the construction of new water, sewer or storm water drainage facilities, or the expansion of such facilities that would cause significant environmental effects. (**Less than Significant**)

The Project would include new, on-site utility infrastructure to serve its new residents. These on-site utilities include:

- An on-site, looped water distribution system that connects to the City's water delivery system at the existing 8-inch water line below Graylawn Avenue;
- An on-site sewer collection system that connects to the City's sanitary sewer system at the existing 8-inch sewer line located below Graylawn Avenue; and
- An on-site storm drain system that collects runoff from the site, and conveys runoff to on-site water quality treatment facilities prior to discharge into the Petaluma River.

Each of these on-site utility systems is an integral part of the overall proposed Project, and has been evaluated in this EIR as part of the Project throughout each of relevant topic areas. In particular, the potential water quality and increased flooding impacts associated with the on-site storm drain system are fully addressed in Chapter 11: Hydrology and Water Quality. Other construction-period

effects are addressed in the Air Quality, Noise and Geology chapters of this EIR. Construction of these utility systems does not generate environmental impacts greater than or in addition to the impacts assumed under the Project.

Solid Waste

Utilities-5: The Project will be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs. (**Less than Significant**)

Construction Waste

The Project site is vacant and no demolition or demolition waste will be generated by development of the Project. However, the construction process will result in generation of solid waste such as wood, metal scrap and formed construction board (cement and dry wall board).

Under the City of Petaluma's Municipal Code, new construction is required to comply with current (2016) CALGREEN Building Code requirements. Among these requirements, section 4.408.1 requires recycling and/or salvage for reuse a minimum of 65% of all non-hazardous construction and demolition waste, or to meet a more stringent local construction and demolition waste management ordinance. Documentation demonstrating compliance with this standard t is required through submittal of a construction waste management plan, as well as verification by a waste management company that diverted construction and demolition waste materials met the requirements.

With implementation of these CALGREEN building code requirements, the Project would comply with all applicable statutes and regulations related to construction waste diversion from landfills.

Residential Waste

According to the California Department of Resources Recycling and Recovery (CalRecycle), a multi-family residential unit generates between 3.6 and 8.6 pounds of solid waste per day. [14] Assuming the maximum, or worst-case rate, the 278-unit Project may generate almost 2,400 pounds per day, or approximately 442 tons of solid waste per year. GreenWaste Recovery (the City's contracted waste hauler in 2006) estimated that in 2006, residential recycling had reached a rate of 60 percent of all home-generated waste.[15] Thus, only 40 percent of the estimated solid waste generated by the Project (960 pounds per day or 177 tons per year) would be expected to be disposed of via landfill. The 960 pounds of solid waste generated at the Project site would amount to approximately 0.03 percent of the 1,390 tons of solid waste that the Redwood Landfill is currently permitted to accept for disposal each day. As a result, the daily tonnage of waste generated by the Project would not exceed daily capacity at the Redwood Landfill.

Furthermore, beginning 2012 the State of California adopted AB 341, which is designed to help meet California's recycling goal of 75% by the year 2020. This law requires multi-family housing complexes with five or more units (such as the Project) to adopt recycling practices. With demonstrated compliance with required recycling practices, the estimated 60% diversion rate used in the above

[14] CalRecycle, Waste Characterization for Residential Developments: Estimated Solid Waste Generation Rates, accessed at http://www.calrecycle.ca.gov/wastechar/wastegenrates/Residential.htm

[15] As reported in Petaluma 360, accessed at http://srweb.sar.dc.publicus.com/article/20080116/COMMUNITY/801160271?Title=Home-recycling-up-7-under-GreenWaste

analysis for the Project could increase to as high as 75%, thus lowering the amount of solid waste needing to be disposed of via landfill even further.

Although the Project would be a new source of solid waste generation, it would not introduce additional waste at disposal or recycling facilities that are at or above capacity, and the Project would comply with all applicable regulations.

Cumulative Impacts

According to the Petaluma General Plan 2025 EIR, "Petaluma is focusing increasingly on waste diversion and recycling through public education and new services and facilities. These factors help accommodate the growing need for solid waste disposal while decreasing per capita solid waste disposal demand. Because Petaluma will likely continue to contract with private waste haulers who transport solid waste to several landfills, solid waste demand will not exceed landfill capacity before General Plan buildout in the year 2025." In addition, Petaluma will continue compliance efforts towards the Integrated Waste Management Act goal of a 75 percent diversion rate of solid waste by 2020. All other reasonably foreseeable development projects proposed within Petaluma would also have the same requirement to comply with City recycling policies and all other local, State and federal regulations related to solid waste disposal. The General Plan contains policies to ensure that the solid waste generated by development would reduce the incremental or per unit demand for increased landfill capacity. Thus, the cumulative impact due to the generation of solid waste is less than significant.

Mitigation Measures

None needed.

16

Energy

The following chapter of this EIR presents an analysis of the Project's relationship to energy conservation goals as described in Appendix F of the CEQA Guidelines. This chapter discusses the physical and regulatory setting, the baseline for determining environmental impacts, the significance criteria used for determining environmental impacts, and potential impacts associated with construction and operation of the Project.

State CEQA Guidelines Appendix F describes the types of information and analyses related to energy conservation to be included in an EIR. Energy conservation is described in terms of decreased per capita energy consumption, decreased reliance on natural gas and oil, and increased reliance on renewable energy sources. To assure that energy implications are considered in project decisions, EIRs must include a discussion of the potentially significant energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

Setting

Energy production and energy use both result in the depletion of nonrenewable resources (e.g., oil, natural gas, coal, etc.) and emission of pollutants. Energy usage is typically quantified using the British Thermal Unit (BTU). The BTU is the amount of energy that is required to raise the temperature of one pound of water by one degree Fahrenheit. As points of reference, the approximate amount of energy contained in a gallon of gasoline, 100 cubic feet (one therm) of natural gas and a kilowatt-hour of electricity, are 123,000 BTUs, 100,000 BTUs, and 3,400 BTUs, respectively.

Electricity

Electricity, a consumptive utility, is a manmade resource. The production of electricity requires the consumption or conversion of energy resources, including water, wind, oil, gas, coal, solar, geothermal, and nuclear resources, into energy. The delivery of electricity involves a number of system components, including substations and transformers that lower transmission line power (voltage) to a level appropriate for on-site distribution and use. The electricity generated is distributed through a network of transmission and distribution lines commonly called a power grid. Conveyance of electricity through transmission lines is typically responsive to market demands.

Energy capacity, or electrical power, is generally measured in watts while energy use is measured in watt-hours. For example, if a light bulb has a capacity rating of 100 watts, the energy required to keep the bulb on for 1 hour would be 100 watt-hours. If ten 100-watt bulbs were on for 1 hour, the energy required would be 1,000 watt-hours or 1 kilowatt-hour. On a utility scale, a generator's capacity is typically rated in megawatts, which is one million watts, while energy usage is measured in megawatt-hours or gigawatt-hours, which is one billion watt-hours.

Natural Gas

Natural gas is a combustible mixture of simple hydrocarbon compounds (primarily methane) that is used as a fuel source. Natural gas consumed in California is obtained from naturally occurring reservoirs,

mainly located outside the State, and delivered through high-pressure transmission pipelines. The natural gas transportation system is a nationwide network and, therefore, resource availability is typically not an issue. Natural gas is used in electricity generation, space heating, cooking, water heating, industrial processes, and as a transportation fuel. Natural gas is measured in terms of cubic feet.

Regional Setting

California's energy system includes electric, natural gas, hydroelectric, nuclear, and petroleum resources. **Table 16-1** shows California's Total System Electric Generation, which is the sum of all in-state generation plus net electricity imports.

Table 16-1: California Total System Electric Generation in Gigawatt Hours (2015)

Fuel Type	In-State Generation	Percent of California In-State Generation	Northwest Imports	Southwest Imports	Total System Power	Percent of Total System Power
Coal	538	0.30%	294	16,903	17,735	6.00%
Large Hydro	11,569	5.90%	2,235	2,144	15,948	5.40%
Natural Gas	117,490	59.90%	49	12,211	129,750	44.00%
Nuclear	18,525	9.40%	0	8,726	27,251	9.20%
Oil	54	0.00%	0	0	54	0.00%
Other	14	0.00%	0	0	14	0.00%
Renewables	48,005	24.50%	12,321	4,455	64,781	21.90%
Biomass	6,362	3.20%	1,143	42	7,546	2.60%
Geothermal	11,994	6.10%	132	757	12,883	4.40%
Small Hydro	2,423	1.20%	191	2	2,616	0.90%
Solar	15,046	7.70%	0	2,583	17,629	6.00%
Wind	12,180	6.20%	10,855	1,072	24,107	8.20%
Unspecified	N/A	N/A	20,901	18,972	39,873	13.50%
Total	**196,195**	**100.0%**	**35,800**	**63,410**	**295,405**	**100.0%**

SOURCE: California Energy Commission, Total System Electric Generation, http://www.energy.ca.gov/almanac/electricity_data/total_system_power.html, accessed June 7, 2017.

California's energy production system provides 66.4% of the electricity,[1] 9% of the natural gas,[2] and 34.1% of the petroleum[3] consumed or used for the State. The rest of the State's energy needs are imported and include: electricity from the Northwest (12.1%) and the Southwest (21.5%);[1] natural gas purchases from Canada (16%), the Rocky Mountain states (40%), and the Southwest (35%);[2] and crude oil imported from Alaska (11.41%) and foreign sources (54.49%).[3]

The production of electricity requires the consumption or conversion of energy resources, including water, wind, oil, gas, coal, solar, geothermal, and nuclear sources. Of the electricity generated in the State in 2015, 59.9% was generated by natural gas-fired power plants, 0.3% was generated by coal-fired power plants, 5.9% came from large hydroelectric dams, and 9.4% came from nuclear power plants.[4] The remaining 24.5% of the in-State total electricity production was supplied by renewable sources. The electricity generated is distributed via a network of transmission and distribution lines commonly referred to as the power grid.

According to the California Energy Commission (CEC), transportation accounts for nearly 37 percent of California's total energy consumption and approximately 37 percent of the State's greenhouse gas emissions.[5] In 2016, California consumed 15.48 billion gallons of gasoline[6] and 3 billion gallons of diesel fuel.[7] Petroleum-based fuels currently account for 90 percent of California's transportation energy sources. However, there could be significant changes in the fuel mix by 2020 due to technology advances, market trends, consumer behavior, and government policies. The range of alternatives to petroleum-based fuels is diverse and includes biofuels, electricity, hydrogen, and natural gas. Overall, demand for gasoline is projected to decline at a rate of up to 3.7 percent per year from 2015 to 2026 because of a slow growth in population and improvements in fuel economy. [8]

Project Setting

Pacific Gas and Electric (PG&E), one of the five largest utilities in the state, is the purveyor of electricity and natural gas in the City of Petaluma. Through PG&E, the city receives electricity via the statewide grid. The state's power grid also has interties to other western states, so some electricity used within California is generated outside the state. Electrical energy is generated by a number of means, including

[1] California Energy Commission, Total System Electric Generation, http://www.energy.ca.gov/almanac/electricity_data/total_system_power.html, accessed June 7, 2017.

[2] California Public Utilities Commission, Natural Gas and California, http://www.cpuc.ca.gov/natural_gas/, accessed June 7, 2017.

[3] California Energy Commission, Oil Supply Sources to California Refineries, http://www.energy.ca.gov/almanac/petroleum_data/statistics/crude_oil_receipts.html, accessed June 7, 2017.

[4] California Energy Commission, Total System Electric Generation, http://www.energy.ca.gov/almanac/electricity_data/total_system_power.html, accessed June 7, 2017.

[5] California Energy Commission. 2015. 2015 Integrated Energy Policy Report. Publication Number: CEC-100-2015-001-CMF.

[6] California State Board of Equalization, Net Taxable Gasoline Gallons, http://www.boe.ca.gov/sptaxprog/reports/MVF_10_Year_Report.pdf, accessed June 14, 2017.

[7] California State Board of Equalization, Taxable Diesel Gallons 10 Year Report, https://www.boe.ca.gov/sptaxprog/reports/Diesel_10_Year_Report.pdf, accessed June 14, 2017.

[8] California Energy Commission. 2015. 2015 Integrated Energy Policy Report. Publication Number: CEC-100-2015-001-CMF.

thermal power plants using natural gas, coal, fuel oil, and/or used tires as fuel; wind turbines; hydroelectric facilities; biomass plants; and large- and small-scale solar installations. Natural gas used in California originates from basins in California, other western states, and Canada.

Population growth is a key driver for increasing residential and commercial energy demands and for water pumping and other energy-intensive services, and the city's population and energy demand will continue to grow. In order to minimize the need for additional electricity generation facilities, both the state and regional energy purveyors have focused investments on energy conservation and efficiency over the past decades.

The Project site is vacant and covered with grasslands and scattered oak woodlands, and does not contain any developed uses that currently consume electricity or natural gas.

Regulatory Setting

Federal and state agencies regulate energy use and consumption through various programs. On the federal level, the U.S. Department of Transportation, U.S. Department of Energy, and U.S. Environmental Protection Agency (EPA) are three agencies with substantial influence over energy policies and programs. Generally, federal agencies influence transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through federal taxes on fuel, through funding of energy-related research and development projects, and through funding for transportation infrastructure projects.

On the state level, the California Public Utilities Commission (CPUC) and CEC are the two agencies with authority over different aspects of energy. The California Public Utilities Commission regulates privately owned utilities in the energy, rail, telecommunications, and water fields. The California Energy Commission collects and analyzes energy-related data, prepares statewide energy policy recommendations and plans, promotes and funds energy efficiency programs, and regulates the power plant siting process.

At the local level, the City of Petaluma, through its regulatory and planning activities, directly influences how, and to what extent, energy is used in the city. Local regulations governing the design, construction and use of buildings affect operational energy needs. Transportation and land use policy decisions directly and indirectly affect petroleum-based fuel use (e.g., mixed-use land uses and improved pedestrian systems can reduce reliance on the private automobile).

Some of the more relevant federal, state, and local energy-related laws and plans are discussed below.

Federal

Energy Policy and Conservation Act

The Energy Policy Act of 1975 was established in response to the oil crisis of 1973, which increased oil prices due to a shortage of reserves. The Act required that all vehicles sold in the U.S. meet certain fuel economy goals. Under this Act, Corporate Average Fuel Economy (CAFE) standards were established. The CAFE standards are fleet-wide averages that must be achieved by each automaker for its car and truck fleet, each year, since 1978. Since 1990, the fuel economy standard for new passenger cars has been 27.5 miles per gallon.[9] Since 1996, the fuel economy standard for new light trucks (gross vehicle

[9] U.S. Department of Transportation, Summary of Fuel Economy Performance, April 28, 2011.

weight of 8,500 pounds or less) has been 20.7 miles per gallon.[10] Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not subject to fuel economy standards. This Act indirectly applies to the Project due to its requirements for increased fuel economy standards particularly for the construction equipment to be used.

Energy Policy Act of 1992

The Energy Policy Act of 1992 set goals, created mandates, and amended utility laws to increase clean energy use and improve overall energy efficiency in the United States. The Act consists of twenty-seven titles detailing various measures designed to lessen the nation's dependence on imported energy, provide incentives for clean and renewable energy, and promote energy conservation in buildings.

Energy Star Program

In 1992, the U.S. EPA introduced Energy Star as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. The program applies to major household appliances, lighting, computers, and building components such as windows, doors, roofs, and heating and cooling systems. Under this program, appliances that meet specifications for maximum energy use established under the program are certified to display the Energy Star label. In 1996, the U.S. EPA joined with the U.S. Department of Energy to expand the program, which now also includes qualifying commercial, industrial and residential buildings. The Energy Star Most Efficient program was launched in May of 2011 to identify and advance highly efficient products in the marketplace. Its goal is to increase market awareness and promote innovation in these products. This program identifies the most efficient products among those that qualify for Energy Star in certain product categories on an annual basis.

Energy Policy Act of 2005

The Energy Policy Act of 2005 seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products, buying hybrid vehicles, building energy efficient buildings, and improving the energy efficiency of residential and commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary micro turbine power plants, and solar power equipment.

Energy Independence and Security Act

In 2007, the Energy Independence and Security Act was signed into law. The Energy Independence and Security Act aims to move the United States toward greater energy independence and security; increase the production of clean renewable fuels; increase the efficiency of buildings, products, and vehicles; promote research on and deploy greenhouse gas capture and storage options; and improve the energy performance of the Federal Government.

State

Renewables Portfolio Standard (SB 1078, SB 107, SB 2)

The California Renewables Portfolio Standard was established in 2002 under Senate Bill (SB) 1078, accelerated in 2006 under SB 107 and expanded in 2011 under SB 2. The Renewables Portfolio Standard

[10] Ibid.

program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33% of total procurement by 2020.[11] In 2015, PG&E served 29.5% of its retail electricity sales with renewable power.[12]

Reducing Dependence on Petroleum (AB 2076)

In response to AB 2076, the CEC and the California Air Resources Board prepared and adopted a joint agency report in August 2003, Reducing California's Petroleum Dependence. The report addresses both near-term and mid- to long-term strategies to reduce the demand for petroleum fuels in California. The two agencies evaluated various demand reduction options and categorized them as fuel efficiency, fuel substitution, pricing, and other options.[13]

Senate Bill 1

Enacted in 2006, SB 1 is the culmination of Governor Schwarzenegger's "Million Solar Roofs Initiative" and builds on the CPUC's California Solar Initiative program, the Energy Commission's New Solar Homes Partnership, and existing incentive programs for publicly owned utility solar energy systems. Senate Bill 1 directs total expenditures of up to $3,350,800,000 by 2017 with goals to install solar energy systems with a generation capacity equivalent of 3,000 megawatts, to establish a self-sufficient solar industry in 10 years so that solar energy systems are a viable mainstream option for homes and commercial buildings, and in 13 years to put solar energy systems on 50 percent of new homes. The overall goal is to help build a self-sustaining solar electricity market combined with improved energy efficiency in the state's residential and non-residential buildings.[14]

Energy Efficiency Act of 2006 (AB 2021)

This bill encourages all investor-owned and municipal utilities to invest aggressively in achievable, cost-effective, energy efficiency programs in their service territories. The results of this bill are expected to reduce forecasted electricity demand by 10 percent over 10 years from 2006 through 2016, offsetting the projected need to build 11 new major power plants. Since its inception, annual reports have been prepared by the CEC to track progress under Assembly Bill (AB) 2021. The most recent report, "Achieving Cost-Effective Energy Efficiency in California: 2013 Status Update," presents an analysis of energy efficiency data compiled from investor-owned utilities' annual reports filed with the CPUC and from the California Municipal Utilities Association who, on behalf of publicly owned utilities, annually files reports with the CEC. As a group, publicly owned utilities achieved 64 percent of their combined annual electricity savings target that was established in 2007. Since 2006, publicly owned utilities have

[11] California Public Utilities Commission, Renewable Portfolio Standard Program Overview, http://www.cpuc.ca.gov/RPS_Overview/, accessed June 14, 2017.

[12] California Public Utilities Commission, Current Renewable Procurement Status, http://www.cpuc.ca.gov/rps_homepage/, accessed June 13, 2017.

[13] California Energy Commission and California Air Resources Board, Reducing California's Petroleum Dependence, http://www.energy.ca.gov/reports/2003-08-14_600-03-005.PDF, accessed June 20, 2017.

[14] California Energy Commission, Guidelines for California's Solar Electric Incentive Programs (SB 1), Third Edition, http://www.energy.ca.gov/2010publications/CEC-300-2010-004/CEC-300-2010-004-CTF.PDF, accessed June 14, 2017.

spent $737 million on energy efficiency, resulting in 2,705 gigawatt hours of reported electricity savings and 511 megawatts in peak demand reduction.[15]

Waste Heat and Carbon Emissions Reduction Act (AB 1613)

Assembly Bill 1613, enacted in 2007 and amended by AB 2791 in 2008, directed the CEC, the CPUC, and the California Air Resources Board (CARB) to implement the Waste Heat and Carbon Emissions Reduction Act. The Act is designed to encourage the development of new combined heat and power systems in California with a generating capacity of not more than 20 megawatts. The Act directs the CPUC, publicly owned electric utilities, and the CEC to establish policies and procedures for the purchase of electricity from eligible combined heat and power systems. It also directs the CARB to report on the reduction in emissions of greenhouse gases resulting from the increase of new electricity generation from combined heat and power systems.[16]

State Alternative Fuels Plan (AB 1007)

Assembly Bill 1007 required the CEC to prepare a state plan to increase the use of alternative fuels in California. In December 2007, the CEC prepared the State Alternative Fuels Plan in partnership with the CARB and in consultation with the other state, federal, and local agencies. The plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce greenhouse gas emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

2008 Energy Action Plan Update

The state adopted the California Energy Action Plan in 2003, followed by the Energy Action Plan II in 2005. The current plan, the California 2008 Energy Action Plan Update, is California's principal energy planning and policy document. The updated document examines the state's ongoing actions in the context of global climate change, describes a coordinated implementation plan for state energy policies, and identifies specific action areas to ensure that California's energy resources are adequate, affordable, technologically advanced, and environmentally sound. The California 2008 Energy Action Plan Update establishes energy efficiency and demand response (i.e., reduction of customer energy usage during peak periods) as the first-priority actions to address California's increasing energy demands. Additional priorities include the use of renewable sources of power and distributed generation (i.e., the use of relatively small power plants near or at centers of high demand). To the extent that these actions are unable to satisfy the increasing energy demand and transmission capacity needs, clean and efficient fossil-fired generation is supported. The California 2008 Energy Action Plan Update examines policy changes in the areas of energy efficiency, demand response, renewable energy, electricity reliability and

[15] California Energy Commission, Achieving Cost-Effective Energy Efficiency in California: 2013 Status Update, http://www.energy.ca.gov/2014publications/CEC-200-2014-002/CEC-200-2014-002.pdf, accessed June 14, 2017.

[16] California Energy Commission, Waste Heat and Carbon Emissions Reduction Act, http://www.energy.ca.gov/wasteheat/, accessed June 14, 2017.

infrastructure, electricity market structure, natural gas supply and infrastructure, research and development, and climate change.[17]

2011 Energy Efficiency Strategic Plan

The Long Term Energy Efficiency Strategic Plan sets forth a roadmap for energy efficiency in California through the year 2020 and beyond. It articulates a long-term vision and goals for each economic sector and identifies specific near-term, mid-term and long-term strategies to assist in achieving those goals. The plan was developed through a collaborative process involving the CPUC regulated utilities (PG&E, Southern California Edison Company, San Diego Gas & Electric Company, and Southern California Gas Company) and over 500 individuals and organizations.[18]

2015 Integrated Energy Policy Report (SB 1389)

In 2002, the Legislature passed SB 1389, which required the CEC to develop an integrated energy plan biannually for electricity, natural gas, and transportation fuels, for the California Energy Report. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for Zero Emission Vehicles and their infrastructure needs, and encouragement of urban designs that reduce vehicle miles traveled and accommodate pedestrian and bicycle access.

The latest update is the 2015 Integrated Energy Policy Report,[19] which was adopted by the CEC on February 10, 2016. This update provides the results of the CEC's assessments of a wide variety of energy issues currently facing California. These issues include future demand for electricity, natural gas, and transportation fuels; energy efficiency in California's existing buildings; publicly owned utilities' progress toward achieving 10-year energy efficiency targets; the definition of zero-net-energy and its inclusion in state building standards; developing transmission needed to support increasing amounts of renewable sources; deploying alternative fuels and advanced vehicle technologies into California's transportation network; decommissioning activities at the San Onofre Nuclear Generating Station; current status of relicensing and related activities at the Diablo Canyon Nuclear Power Plant; future of spent fuel storage in California; electricity infrastructure in southern California; evaluating drought impacts on the power supply and improving water efficiency; and new research findings on the vulnerability of California's energy system.

Clean Energy and Pollution Reduction Act (SB 350)

In October 2015, Governor Brown signed SB 350, the Clean Energy and Pollution Reduction Act, establishing new goals for clean energy, clean air and greenhouse gas reductions for 2030 and beyond. SB 350 increases California's renewable electricity procurement goal from 33 percent by 2020 to

[17] California Energy Commission, 2008 Energy Action Plan Update, http://www.energy.ca.gov/2008publications/CEC-100-2008-001/CEC-100-2008-001.PDF, accessed June 13, 2017.

[18] California Energy Commission, 2011 Energy Efficiency Strategic Plan, http://www.energy.ca.gov/ab758/documents/CAEnergyEfficiencyStrategicPlan_Jan2011.pdf, accessed June 14, 2017.

[19] California Energy Commission. 2015. 2015 Integrated Energy Policy Report. Publication Number: CEC-100-2015-001-CMF.

50 percent by 2030. This will increase the use of Renewables Portfolio Standard eligible resources, including solar, wind, biomass, geothermal, and others. In addition, SB 350 requires the state to double statewide energy efficiency savings in electricity and natural gas end uses by 2030. To help ensure these goals are met and the reductions in greenhouse gas emissions are realized, large utilities will be required to develop and submit Integrated Resource Plans. These Integrated Resource Plans will detail how each entity will meet their customers resource needs, reduce greenhouse gas emissions and ramp up the deployment of clean energy resources.[20]

California Building Codes

California's Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) were first established in 1978 to reduce California's energy consumption. Energy efficient buildings require less electricity, natural gas, and other fuels, the use of which creates GHG emissions. The standards, updated in 2016, focus on three key areas: updating residential requirements to move closer to California's zero net energy goals, updating nonresidential and high-rise residential requirements, and improving the clarity and consistency of existing regulations. Single-family homes built with the Energy Commission's 2016 Building Energy Efficiency Standards will use about 28 percent less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards.[21]

The Green Building Standards Code (also known as CALGreen), which requires all new buildings in the state to be more energy efficient and environmentally responsible, took effect in January 2011 and was most recently updated in 2016. These comprehensive regulations are intended to achieve major reductions in greenhouse gas emissions, energy consumption, and water use. The 2016 CALGreen Code addresses clean air vehicles and increased requirements for electric vehicle charging infrastructure. A new universal waste code section has been incorporated for additions and alterations. Organic waste is new and includes an exception for rural jurisdictions. Water efficiency and conservation includes a new section for food waste disposers.[22]

Local, City of Petaluma

Petaluma General Plan, Community Design, Character and Green Building Element

The City's General Plan 2025 Community Design, Character and Green Building Element includes goals, policies and programs to promote "green buildings." Green building encompasses the environmental, economic, and social impacts of buildings, including energy efficiency, water conservation, and indoor environmental quality, use of recycled and renewable materials, construction waste reduction, and site planning.

Specific goals, policies and programs relevant to the Project and the Project site include the following:

[20] California Energy Commission, Clean Energy & Pollution Act SB 350 Overview, http://www.energy.ca.gov/sb350/, accessed June 14, 2017.

[21] California Energy Commission, Energy Commission Continues March toward Zero Net Energy with 2016 Building Energy Efficiency Standards, http://www.energy.ca.gov/releases/2015_releases/2015-06-10_building_standards_nr.html, accessed June 14, 2017.

[22] California Department of General Services, Guide to the 2016 California Green Building Standards Code, https://www.documents.dgs.ca.gov/bsc/CALGreen/CALGreen-Guide-2016-FINAL.pdf, accessed June 14, 2017.

GOAL 2-G-18: Green Building. Provide leadership and guidance to ensure the application of sustainable site planning and green building practices.

a. **Policy 2-P-122:** Require development projects to prepare a Construction Phase Recycling Plan that would address the reuse and recycling of major waste materials (soil, vegetation, concrete, lumber, metal scraps, cardboard packaging, etc.) generated by any demolition activities and construction of the project.

Petaluma General Plan, Natural Environment Element

The City's General Plan 2025 Natural Environment Element includes goals, policies and programs related to energy resources. Reduced energy use in housing, commercial structures, public facilities, and transportation helps maintain local economic vitality and reduces the need for new infrastructure to deliver energy to the city.

Specific goals, policies and programs relevant to the Project and the Project site include the following:

GOAL 4-G-4: Energy. Reduce reliance on non-renewable energy sources in existing and new development.

b. **Policy 4**-P-18: Develop and adopt local energy standards that would result in less energy consumption than standards set by the CEC's Title 24 or updates thereto.

c. **Policy 4-P-19**: Encourage use and development of renewable or nontraditional sources of energy.

d. **Policy 4-P-20**: Continue to participate in undergrounding of public utility lines; whenever appropriate, require conversion of overhead lines to underground in conjunction with public and private projects.

Climate Action Plan

To address GHG emissions within its boundaries, the City of Petaluma adopted resolutions 2002-117 and 2005-118, which call for the City to participate in the Cities for Climate Protection effort and established targets for greenhouse gas reduction of 25 percent below 1990 levels by 2015 for community emissions, and 20 percent below 2000 levels by 2010 for municipal government operations. In addition, the City is currently preparing a Climate Action Plan in partnership with the County and other local jurisdictions. This effort will implement General Plan Policy 4-P-27, which calls for preparation of such a plan.

Impact Analysis

Standards of Significance

Section 15126.4 (a)(1) of the CEQA Guidelines states that an EIR shall describe feasible measures which could minimize significant adverse impacts, including, where relevant, inefficient and unnecessary consumption of energy.

Appendix F of the CEQA Guidelines provides guidance for assessing energy impacts of projects. The appendix provides three goals: 1) decreasing overall per capita energy consumption; 2) decreasing reliance on natural gas and oil; and 3) increasing reliance on renewable energy sources. Neither Appendix F of the State CEQA Guidelines nor PRC Section 21100(b)(3) provide a threshold of significance that might be used to evaluate the potential significance of energy consumption of a proposed project. Rather, the emphasis is on reducing "the wasteful, inefficient, and unnecessary consumption of energy." As such, the Project's impact would be considered significant if it would:

1. Involve the wasteful, inefficient, and unnecessary consumption of energy, especially fossil fuels such as coal, natural gas, and petroleum, associated with project design, project location, the use of

electricity and/or natural gas, and/or the use of fuel by vehicles anticipated to travel to and from the project; or

1. Result in the excessive consumption of energy resources that could not be accommodated within the long-term electricity supply and distribution system or the long-term natural gas supply and distribution system of their respective supplier.

Methodology

Appendix F recommends that an EIR present the total energy required by a project by fuel type and end use during construction, operation, and/or removal of the project. If appropriate, the discussion should consider the energy intensiveness of materials and equipment required for the project.

The analysis below focuses on the three sources of energy relevant to the Project: electricity, natural gas, and transportation fuel for vehicle trips associated with new development, as well as the fuel necessary for Project construction. The analysis of electricity and natural gas usage is based on California Emissions Estimator Model (CalEEMod) air quality and greenhouse gas emissions modeling (included in **Appendix 5A**).

Wasteful, Inefficient or Unnecessary Consumption of Energy

Energy-1: Construction and operation of the Project would increase the consumption of energy, but would not result in the wasteful, inefficient, and unnecessary consumption of energy. **(Less than Significant**)

Construction

Construction-related energy expenditures would include both direct and indirect uses of energy in the form of fuel (diesel and gasoline) and electricity. Indirect energy use typically represents about three-quarters of total construction-related energy consumption, while direct energy represents about one quarter of consumption.[23]

Indirect energy use includes the energy required to make the materials and components used in construction of the Project. This includes energy used for the extraction of raw materials, manufacturing, and transportation associated with manufacturing. Because of the large number of materials and manufacturers involved in the production of construction materials (including manufacturers in other states and countries), indirect energy use cannot be reasonably estimated. However, it is reasonable to assume that manufacturers of building materials such as concrete, steel, etc., employ all reasonable energy conservation practices in the interest of minimizing the cost of doing business. Furthermore, neither the City nor the applicant has control over or the ability to influence energy resource use by the manufacturers of construction materials. Therefore, this analysis does not evaluate indirect energy use.

Direct energy use includes consumption of petroleum fuels for operation of construction vehicles, delivery trucks, and construction workers traveling to/from the Project site. Direct energy use also includes electricity for construction equipment and water conveyance, which varies throughout the construction period, based on the construction activities being performed.

[23] Hannon, et al., Energy and Labor in the Construction Sector, http://science.sciencemag.org/content/202/4370/837, Science Magazine, November 24, 1978.

Electricity will be consumed for the conveyance of water used during Project construction for dust control (supply and conveyance), and to power any necessary lighting during construction, electronic equipment, or other construction activities necessitating electrical power. Such electricity demand would be temporary, nominal, and would cease upon the completion of construction. Construction activities associated with the Project require limited consumption of electricity, and would not have an adverse impact on available electricity supplies and infrastructure. The use of electricity during Project construction would not be wasteful, inefficient or unnecessary.

Construction of the Project is expected to last approximately 20 months. Site preparation, grading, building construction, paving, and architectural coating activities will consume energy in the form of gasoline and diesel fuel through the operation of heavy off-road equipment, trucks, and worker traffic. The estimate of fuel consumption by construction equipment during the construction phase is based on equipment lists derived as default assumptions of the CalEEMod air quality model. Energy consumption associated with on-site operation of construction equipment is summarized in **Table 16-2**, which includes a list of the assumed construction equipment used during Project construction.

Table 16-2: Diesel Fuel Consumption for Operation of Construction Equipment Onsite

Phase	Equipment Type	Units	Hours	Horse Power	Load Factor	Number of Days	Fuel Usage (HP/hr)	Diesel Usage (in gallons)
Site Preparation	Rubber Tired Dozers	3	8	247	0.4	10	0.05	1,186
	Tractors/Loaders/ Backhoes	4	8	97	0.37	10	0.05	574
Grading	Excavators	2	8	158	0.38	30	0.05	1,441
	Graders	1	8	187	0.41	30	0.05	920
	Rubber Tired Dozers	1	8	247	0.4	30	0.05	1,186
	Scrapers	2	8	367	0.48	30	0.05	4,228
	Tractors/Loaders/ Backhoes	2	8	97	0.37	30	0.05	861
Building Construction	Cranes	1	8	231	0.29	300	0.05	8,039
	Forklifts	3	8	89	0.2	300	0.05	6,408
	Generator Sets	1	8	84	0.74	300	0.05	7,459
	Tractors/Loaders/ Backhoes	3	7	97	0.37	300	0.05	11,305
	Welders	1	8	46	0.45	300	0.05	2,484
Paving	Cement and Mortar Mixes	2	8	9	0.56	20	0.05	81
	Pavers	2	8	130	0.42	20	0.05	874
	Paving Equipment	2	8	132	0.36	20	0.05	760
	Rollers	2	8	80	0.38	20	0.05	486
	Tractors/Loaders/ Backhoes	1	8	97	0.37	20	0.05	287
	Rubber Tired Loaders	2	8	203	0.36	20	0.05	1,169
Architectural Coating	Air Compressors	1	6	78	0.48	20	0.05	225
						Total Diesel Fuel Consumption:		**49,973**

Source: CalEEMod Model Data, Appendix 5A

As shown in Table 16-2, a total of approximately 50,000 gallons of diesel fuel will be consumed by construction equipment over the 20-month construction period. On average, 2,500 gallons of diesel fuel would be consumed per month. Assuming that construction would occur five days per week (20 days per month), an average of approximately 125 gallons of diesel fuel would be consumed from operation of the construction equipment per day.

Construction workers traveling to/from the Project site in their own personal vehicles will contribute to the Project's fuel consumption, as will vendor's trips during building construction, and haul trips for soil removal during site preparation and grading. Energy consumption by vehicles traveling to and from the Project site is summarized in **Table 16-3**.

Table 16-3: Fuel Consumption for Construction Travel To/From Project Site

Phase	Number of Daily Trips	Number of Days	Average Round-Trip Commute Distance (in miles)	Fuel Usage (mpg)[1]	Gasoline/Diesel Usage (in gallons)
Gasoline (Worker Trips)					
Site Preparation	18	10	12.4	18.6	120
Grading	20	30	12.4	18.6	400
Building Construction	331	300	12.4	18.6	66,200
Paving	28	20	12.4	18.6	373
Architectural Coating	66	20	12.4	18.6	880
				Total Gasoline Usage:	**67,973**
Diesel					
Vender Trips - Building Construction	81	300	7.3	10	17,739
Haul Trips – Site Preparation and Grading	1,809 [2]		20	10	3,618
				Total Diesel Usage:	**21,357**

Source: CalEEMod Model Data; Appendix 5A

Notes:

mpg – miles per gallon

1. This is a conservatively estimated total, as it assumes no electric, hybrid or other alternate fuel use vehicles in the fleet mix.
2. Number of haul trips total for entire phase

As shown in Table 16-3, a total of approximately 68,000 gallons of gasoline and 21,360 gallons of diesel fuel would be consumed by construction-related vehicles traveling to and from the Project site over the 32-month construction period. On average, a total of 2,125 gallons of gasoline would be consumed per month, and approximately 4,175 gallons of diesel fuel would be consumed during the maximum month period (during soil removal hauling) for construction-related travel.

Table 16-4 summarizes the total fuel consumption anticipated during Project construction, which includes energy fuel use from the operation of construction equipment on-site and the fuel use from vehicles traveling to and from the Project site. As shown in this table, a total of approximately 68,000 gallons of gasoline and 71,350 gallons of diesel fuel would be consumed during construction activity.

Table 16-4: Total Fuel Consumption During Project Construction

	Gasoline Usage (in gallons)	Diesel Usage (in gallons)
Operation of Construction Equipment Onsite		49,973
Worker Trips	67,973	
Vendor Trips		17,739
Hauling Trips		3,618
Total Over 32-month Period	**67,973**	**71,330**

Source: CalEEMod Model Data

This fuel consumption would be temporary and would cease upon the completion of construction, and construction-related fuel consumption would not result in a wasteful, inefficient or unnecessary consumption of energy. Implementation of Mitigation Measure AQ-2A: Basic Dust Control, which is described and analyzed in Chapter 5, Air Quality of this EIR, would ensure that fuel energy consumed in the construction phase would not be wasted through unnecessary idling or through the operation of poorly maintained equipment.

For comparison, the State of California consumed 15.48 billion gallons of gasoline[24] and 3 billion gallons of diesel fuel in 2016.[25] On a monthly basis, the State consumed 1.29 billion gallons of gasoline and 250 million gallons of diesel fuel. Fuel consumption during Project construction would result in a very small fraction of the total fuels consumed in the State of California. The Project would not result in the wasteful, inefficient, and unnecessary consumption of energy resources. As such, construction-related energy impacts would be less than significant.

Operation

Energy use associated with the Project's long-term operations includes electricity and natural gas consumption by residents (e.g., for lighting, electronics, heating, air conditioning and refrigeration), energy consumption related to water usage and solid waste disposal, and fuel consumption (gasoline and diesel) by vehicles associated with the Project through the generation of new vehicle trips.

Electricity and Natural Gas

According to the CalEEmod estimates, the Project would result in an electricity demand of approximately 1,410, 000 kWh per year (1.4 GWh/yr). The total electric generation system for California generated 290,567 GWh in 2016. In comparison, the Project's electricity demand represents only approximately 0.0005 percent of the 2016 statewide annual electricity demand.

According to the CalEEmod estimates, the Project would result in a demand of approximately 3.2 thousand BTUs per year of natural gas (3.162 million cubic feet of natural gas per year). California's total demand for natural gas for industrial, residential, commercial and electric power generation was 2,313 billion cubic feet per year in 2012. In comparison, the Project's demand represents an insignificant fraction of the 2012 annual statewide demand for natural gas.

Title 24 is the State's principal building energy efficiency policy. The goals of Title 24 are to improve energy efficiency of residential and non-residential buildings, minimize impacts during peak energy-usage periods, and reduce impacts on state energy needs. The Project will be required to comply with Title 24 requirements, as well as California Green Building Code (CALGreen) standard requirements per City of Petaluma ordinance, and therefore would be energy efficient.

Energy consumption in the forms of electricity and natural gas during Project operation would result in a very small percentage of the total energy consumed by the State of California. The Project would be required to comply with Title 24 and CALGreen's Tier 1 building code requirements (per City of Petaluma ordinances), inclusive of sustainable features to minimize energy consumption during Project operation. Therefore, the Project would not result in the wasteful, inefficient or unnecessary consumption of

[24] California State Board of Equalization, Net Taxable Gasoline Gallons, http://www.boe.ca.gov/sptaxprog/reports/MVF_10_Year_Report.pdf, accessed June 14, 2017.

[25] California State Board of Equalization, Taxable Diesel Gallons 10 Year Report, https://www.boe.ca.gov/sptaxprog/reports/Diesel_10_Year_Report.pdf, accessed June 14, 2017.

electricity and natural gas during Project operation. As such, operational-related energy impacts related to electricity and natural gas would be less than significant.

Petroleum-Based Fuel

The proposed project would result in the consumption of petroleum-fuel related to vehicular travel (quantified as vehicle miles traveled (VMT) to and from the project site. **Table 16-5** presents the projected consumption of approximately 27,228 gallons of diesel and 197,292 gallons of gasoline per year, for a total of 224,520 gallons of petroleum-based fuels per year. The Project's projected annual fuel consumption is based on CalEEMod's an annual estimate of 4,406,200 VMT, and fuel efficiency rates as obtained from the U.S. Department of Transportation and Federal Highway Administration's publication titled, "Our Nation's Highways 2011." The estimates are conservative since they assume that no electric, hybrid, or other alternative fuel use vehicles are in the fleet mix. Federal and state laws and regulations will continue to require further improvements in fuel efficiency in motor vehicles produced and/or sold in the United States, and total annual consumption of petroleum-based fuel is expected to decrease over time.

Table 16-5: Estimated Petroleum-based Fuel Usage at Buildout

Mobile Source	Fleet Mix [a]	Generation Factor [b, c]	Annual Consumption (in gallons)
Diesel (gallons)	15.70%	4,406,200 VMT/25.1 mpg	27,560
Gasoline (gallons)	84.30%	4,406,200 VMT/18.6 mpg	198, 990
		Total Fuel Usage:	**226,550**

Source: CalEEMod Data

Notes:

mpg = miles per gallon

a Data Source: USDOT and FHWA, Our Nation's Highways 2011, Chapter 5, Motor Fuel, Fuel Consumption by State and Type, https://www.fhwa.dot.gov/policyinformation/pubs/hf/pl11028/onh2011.pdf

b Data Source: California Department of Transportation, 2007 California Motor Vehicle Stock, Travel and Fuel Forecast, http://www.energy.ca.gov/2008publications/CALTRANS-1000-2008-036/CALTRANS-1000-2008-036.PDF

c Diesel fuel contains roughly 10-15% more energy per gallon than gasoline. US Department of Energy, Model Year 2017 Fuel Economy Guide, http://www.fueleconomy.gov/feg/pdfs/guides/FEG2017.pdf

In 2016, California consumed 15.48 billion gallons of gasoline and 3 billion gallons of diesel fuel. Residents of the Project would use a very small fraction of the 2016 statewide annual fuel consumption.

The greenhouse gas emissions analysis as described in Chapter 9: Greenhouse Gas Emissions shows that the Project's total emissions from all energy use, including petroleum-based fuel use, will not exceed the threshold levels. The Project's GHG emissions are driven primarily (76% of total emissions) by vehicle emissions from petroleum-based fuel use. The GHG analysis concludes that the Project GHG emissions will be below established thresholds, which further supports a conclusion that the Project's use of energy will not be wasteful or inefficient. The Project would not result in the wasteful, inefficient or unnecessary consumption of petroleum-based fuel during Project operation. As such, operational-related energy impacts related to the consumption of petroleum-based fuel would be less than significant.

Water Conveyance and Solid Waste

Solid waste management for the Project would require energy consumption. The Project would also result in energy consumption for the provision of potable water due to supply, treatment and distribution. As indicated in the GHG chapter of this EIR, the Project will be required to comply with CALGreen building standards, which includes standards to reduce potable water demand for both indoor and outdoor use. By limiting water demand on-site through efficient irrigation of landscaping and water-efficient fixtures and appliances indoors, wasteful or inefficient use of water would be reduced and energy consumption associated with water use would be minimized.

The GHG analysis of this EIR indicates that the Project's total emissions from all energy use, including solid waste management and water conveyance, will not exceed threshold levels, which further supports a conclusion that the Project's use of energy will not be wasteful or inefficient.

Conclusion

Energy would be consumed through daily residential activities, the delivery of water for potable and irrigation purposes, solid waste management, and daily vehicle use by residents and visitors. While the long-term operation of the Project would result in an increase in energy consumption compared to existing conditions, the Project will be required to incorporate design measures related to electricity, natural gas and water use pursuant to Title 24, CALGreen, and Tier 1 building code requirements per City of Petaluma ordinances that promote energy efficiency and reduce future demand for energy from the Project. Therefore, operation of the Project would not result in the wasteful, inefficient or unnecessary consumption of energy.

Mitigation Measures

None needed.

Excessive Consumption of Energy Resources

Energy-2: The Project would not result in the excessive consumption of energy resources that could not be accommodated within the long-term electricity supply and distribution system or the long-term natural gas supply and distribution system. (**Less than Significant**)

Construction

Construction-related energy expenditures include both direct and indirect uses of energy in the form of fuel (typically diesel and gasoline) and electricity. Electricity would be consumed for the conveyance of water used during Project construction for dust control (supply and conveyance), and to power any necessary lighting during construction, electronic equipment and other construction activities necessitating electrical power. Such electricity demand would be temporary, nominal and would cease upon the completion of construction. Construction activities of the Project would require limited electricity consumption, and would not have an adverse impact on PG&E supplies and distribution systems. Therefore, construction-related impacts on the existing electricity and natural gas supply and distribution systems would be considered less than significant.

Operation

The Project's electricity demand represents a very small fraction of the statewide annual electricity demand and natural gas demand, and the Project's increased demand for these resources would not require the construction of new power generation facilities. Furthermore, the Project is consistent with

planning and growth projections for the City of Petaluma. The electrical loads and natural gas demand associated with the Project are within the projected growth parameters of the City, and PG&E will be able to meet the demand in this area. It is anticipated that PG&E would be able to provide natural gas and electricity to the Project site using existing infrastructure, and only minor modifications for on-site distribution systems would be required to connect the Project to the existing off-site electrical grid system. Operation of the Project would not result in consumption of energy resources that could not be accommodated within the long-term electricity and natural gas supply and distribution system of PG&E. The Project's operational impact on the existing electricity and natural gas supply and distribution systems would be less than significant.

Mitigation Measures

None needed.

Energy-3: Project operation would not significantly increase peak or baseline-period electricity demand. (**Less than Significant**)

Peak electrical load periods in the City of Petaluma coincide with high temperatures in the summer and subsequent air conditioner usage. As such, the Project would contribute to PG&E's summer peak demand for electricity. The Project would result in an electricity demand of approximately 1.4 GWh, as compared to the total statewide 2016 electrical system generation of 290,567 GWh. In comparison, the Project's electricity demand represents a very small fraction of the 2016 statewide annual electricity demand, including peak electricity demand.

The peak and base period energy demand can be influenced by retail rate levels and design (i.e., usage demand and energy charges, and customer connection charges), inclusion of low income rate assistance, energy efficiency and demand response program implementation and participation, and changes in socioeconomic patterns. PG&E offers a variety of energy-savings programs to help its electric customers reduce their peak electric usage. Some of those programs include the SmartRate Plan, SmartAC Program, Energy Savings Assistance Program, and Home Upgrade Program. These programs influence peak period demand. However, demand would remain primarily driven by the climate and customer base.

While Project operation would slightly increase electricity demand, PG&E has sufficient capacity and infrastructure to support this minor increase in electricity demand. Therefore, Project operation would not significantly increase peak and base electricity demand and impacts would be considered less than significant.

Mitigation Measures

None needed.

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Effects Found not to be Significant

Section 15128 of the CEQA Guidelines requires that the EIR "contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR."

On July 11, 2007, the City of Petaluma issued the Notice of Preparation of this Draft EIR, including a full CEQA Checklist indicating that the proposed Project may have a significant effect on the environment and that an EIR is required. The 2007 Initial Study identified those environmental issues associated with the proposed Project that were determined to be less than significant, and focused this EIR on those impacts determined to be potentially significant. Project-related impacts to the following CEQA topics were determined not to be significant, and no additional analysis is included in this DEIR:

- Agricultural resources,
- Hazards (related to airport hazards and wildland fires, only)
- Mineral resources,
- Population and housing, and
- Public services, including recreation

With the exception of the issues briefly discussed below, all other environmental topics are fully addressed in this EIR, as found in Chapters 4 through 15.

Agricultural Resources

The Project site has not been in agricultural use for more than 30 years, and development as proposed would not result in the conversion of any Farmland, either on- or off-site, to non-agricultural use.

The Project site is not zoned for agricultural use, and is not under a Williamson Act contract. A PUD zone established in 1982 applies to APN -007, -008 and -009. The PUD zone was approved by the City of Petaluma (as Resolution No. 9628) authorizing a PUD Development Plan for the 76-unit Oak Creek Apartments project. In addition to approval of the Oak Creek Apartment project, that PUD included a number of conditions that specifically pertain to the remaining properties under that PUD permit, now part of the Project's proposed development site. Those conditions include a limitation that use of the vacant portion of the Oak Creek Apartments site (i.e., APN -009) be limited to uses permitted in the Agricultural District as specified in the Zoning Ordinance. This is not interpreted as implying the site was re-zoned to Agriculture, but rather this was the mechanism utilized to preclude development until the land was re-zoned[1].

No portion of the area surrounding the Project site is in active agricultural or timberland use, and development of the Project site as proposed would not be expected to jeopardize the viability of any

[1] As noted in the December 22, 1981 Staff Report to the Planning Commission.

existing agricultural or timberland operations in the vicinity, or result in the conversion of any Farmland or Timberland in the Petaluma area to non-agricultural use.

Hazards

The Project site is located within the urban boundaries of the City of Petaluma, surrounded principally by residential land uses and does not abut wildlands. There are no wildland areas in the Project site vicinity, and the Project would therefore not result in any exposure of people or structures to risk of loss, injury or death involving wildland fires. The threat of wildland fires associated with this Project is less than significant, and not discussed further in this EIR.

The Project site is not located near any private airstrip. The nearest airport to the Project site is the Petaluma Municipal Airport, located 2 miles to the east. The Project site is not included within the Airport Land Use Plan including the "conical zone" approach area, and would therefore not result in a safety hazard for people working or residing in the Project area and its impacts on airport operations are less than significant and not discussed further in this EIR.

Mineral Resources

There are no known mineral resources of major value to the region or the residents of the state on the Project site. The Project site is not included on any County or City map of mineral resource recovery sites.

Population and Housing

Development of the Project site as proposed would result in 278 new apartments and the new residents would directly add to the population of Petaluma.

The U.S. 2010 Census results reported a City of Petaluma population of 57,941 people.

Census tracts are statistical areas defined by the U.S. Census Bureau. In heavily populated areas, a census tract is smaller than a city and usually smaller than a zip code. Census Tracts 1506.01, 1506.02, 1506.03, 1506.04, 1507, 1508 and 1509 are all with the city limits of the City of Petaluma. Census Tracts 1510, 1511 and 1512.01 are not within the city limits, but are included in ABAG's population projections for the Petaluma Sub-regional Study Areas. The Petaluma Sub-Regional Study Area is generally consistent with the City's Sphere of Influence (with the exception of unincorporated Penngrove, which is assigned to the Rural Rohnert Park-Cotati Sub-Regional Study Area.

At the City's average population density of 2.6 persons per household,[2] the development of 278 new apartment units could be expected to add approximately 723 new residents to Petaluma's population, an increase of approximately 1.0 percent. This level of population growth attributable directly to the Project would not be regarded as substantial. The only infrastructure improvement proposed by the Project applicant are those necessary to enable development of the Project site alone, and would not be available to support additional development in the surrounding area. The growth-inducing effects of the Project as proposed would be less than significant.

There are no existing housing units or residences on the Project site and development of the Project site as proposed would not displace any existing housing units. No people currently live at the Project site, and development of the Project site as proposed would not displace any people.

[2] 2.60 persons per household based on Census 2010, Fact Sheet, City of Petaluma

Public Services

Fire Protection

Development of the Project site as proposed would result in 278 new apartment units where future residents would place an additional demand on existing fire protection and emergency medical response units. However, the development of 278 apartments would not require the Petaluma Fire Department to construct additional fire stations or expand any existing facilities to serve the Project site effectively following development. In the absence of any Project-related need for new construction related to fire protection, this impact would be considered less than significant. Prior to development of the Project site, the Project Developer would be required to pay all applicable impact fees related to fire protection to enable the City to continue to meet established service objectives.

Police Protection

Development of the Project site as proposed would result in 278 new apartment units where future residents would place an additional demand on the Petaluma Police Department. However, the development of 278 apartments would not require the Petaluma Police Department to construct additional police stations or expand any existing facilities in order to serve the Project site effectively following development. In the absence of any Project-related need for new construction related to police protection, this impact would be considered less than significant. Prior to development of the Project site, the Project Developer would be required to pay all applicable impact fees related to police protection to enable the City to continue to meet established service objectives.

Public Schools

Development of the Project site as proposed could be expected to increase the local population by approximately 723 people. Using a multiplier of 0.42 for multifamily development (which assumes that each of the apartments will generate an average of 0.42 new public school students), the development of the 278 apartments at the Project site would be expected to generate approximately 117 new students who would need to be accommodated in the public schools (distributed within grades K through 12). This level of development would not be expected to require the development of new public schools beyond that already anticipated. In the absence of any Project-related need for new construction related to public schools, this impact would be considered less than significant. The Project Developer would be required to pay all applicable mitigation fees for school impact as established by the affected school districts prior to the issuance of any building permits. Under Government Code Section 65995, the payment of these fees is deemed full and complete mitigation for Project-related impacts on public school facilities.

Parks and Recreation

Development of the Project site as proposed could be expected to increase demand for existing parks and recreational facilities within Petaluma and the region. However, the addition of approximately 723 new residents in the 278 proposed apartments at the Project site would not be expected to require the development of new parks or recreational facilities beyond those already anticipated. In the absence of any Project-related need for new construction related to parks and recreational facilities, this impact would be considered less than significant. Prior to development, the Project Developer would be required to pay all appropriate City park/recreation fees to enable the City to continue to meet established service objectives.

Other Public Facilities

Development of the Project site as proposed would be expected to place additional demands on other public facilities (e.g., area libraries, City Hall, etc.), as it would add new residents to the local population. However, the development of 278 apartments would not require the City of Petaluma to construct additional public facilities or expand any existing public facilities in order to serve those living at the Project site effectively following development. In the absence of any Project-related need for new construction related to other public facilities, this impact would be considered less than significant.

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Alternatives

Introduction

The California Environmental Quality Act Guidelines (CEQA Guidelines, 1970, as amended, Section 15126.6) requires an EIR to analyze a reasonable range of alternatives to the proposed Project. The purpose of the alternatives section is to provide decision-makers and the public with a discussion of alternatives to the project or its location that are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be costlier. Evaluation of alternatives should present the proposed action and all the alternatives in comparative form to define the issues and provide a clear basis for choice among the options. CEQA provides the following guidelines for discussing project alternatives:

- An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation (§15126.6(a)).
- An EIR is not required to consider alternatives which are infeasible (§15126.6(a)).
- The discussion of alternatives shall focus on alternatives to the project or its location that can avoid or substantially lessen any significant effects of the project (§15126.6(b)).
- The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects (§15126.6(c)).
- The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis and comparison with the proposed project (§15126.6(d)).

Accomplishing Basic Project Objectives

CEQA requires an analysis of alternatives that would feasibly attain most of the basic objectives of the project. The Project applicant has identified the following objectives for developing the Project site:

- Provide for new, relatively high-density residential development within the City of Petaluma's current Urban Growth Boundary (UGB), thereby reducing pressure to expand the existing UGB to support future residential development.
- Add to the City's stock of available multi-family housing, which currently provides approximately 13 percent of the City's total housing stock.
- Create a new housing development that is proximate to community resources, recreation, retail, culture, and rail service, and that promotes walkability to these destinations.
- Implement provisions of the Petaluma River Access and Enhancement Plan by improving flood control capability and increasing public access to, and enjoyment of the Petaluma River, with

establishment of a multi-use trail for pedestrians and bicyclists along the River bank and within the Project site. River enhancements will be conducted in a manner that preserves the natural biological value and ecological function while balancing flood control objectives.

Alternatives Analyzed

CEQA requires the identification and analysis of alternatives that would avoid or substantially lessen the significant effects of the project. One of the major constraints to development of the Project is its proposed access via the Shasta Avenue extension across the SMART rail tracks. This proposed at-grade rail crossing presents safety hazards to motorists, pedestrian, bicyclists and rail carriers. Approval of an at-grade rail crossing is under the jurisdiction of the CPUC, and their staff has already indicated to the City that the Commission is unlikely to approve such a crossing, as it conflicts with their policies. Consequently, one of the key objectives in developing alternatives to the proposed Project is to identify alternatives that could potentially be developed without reliance on the Shasta Avenue extension. The only other available means of access to the Project site is existing Graylawn Avenue. The proposed emergency vehicle access (EVA) at Bernice Court is adequate to provide the secondary means of emergency vehicle access that City roadway design standards and safety requirements mandate must be provided to any new developments or subdivisions. However, there remain two key constraints to the use of Graylawn as the only means of public access to a project at this site:

- The 1982 PUD that resulted in development of the existing Oak Creek Apartment project included a condition of approval that, “All major accesses to future developments in the remaining vacant property in the vicinity of the project (i.e., APN-009) shall be from the Rainier Avenue extension or other new public street, rather than to streets to the south such as Graylawn Avenue and Burlington Drive.”
- The City of Petaluma’s General Plan identifies Graylawn Avenue as a local residential road. Pursuant to the City’s Street Standards for livable streets, local residential roadways are intended to carry a maximum of 2,000 average daily vehicle trips (ADTs), serving up to 200 dwellings. Graylawn Avenue already carries approximately 954 ADTs, and thus has a maximum remaining capacity of 1,046 ADTs before exceeding the design standards.

Each of the following alternatives to the Project has been identified to address these key development constraints at the site, as well as to reduce and/or avoid other identified environmental impacts of the proposed Project. The alternatives included in this EIR are:

- Alternative 1#: No Project, No Development
- Alternative #2: APN-006 (Webb Parcel) Development Only
- Alternative #3: Redistributed Density Project
- Alternative #4: Reduced Project (based on the design capacity of Graylawn as the primary access and environmentally sensitive siting)

Summary Comparison of Alternatives

Table 18-1 compares the amount of development proposed by the Project and the alternatives.

Table 18-1: Summary Comparison of Alternatives

	Proposed Project	Alternative 1: No Project – No Development	Alternative 2: APN #-006 (Webb Parcel) Development Only	Alternative 3: Redistributed Density	Alternative 4: Reduced Project
Units	278	1	35-79	79	149
Unit Type	Multi-family apartments	SF residential home with accessory on 006	Multi-family apartments	Multi-family apartments or SF residential lots	Multi-family apartments
Primary Access	Graylawn and Shasta Avenue extension	Graylawn	Graylawn, with Bernice EVA	Graylawn, with Bernice EVA	Graylawn, with Bernice EVA
Approximate Development Area (ac)	15.45 ac.	4.39 ac.	4.39 gross ac.	15.45 ac.	Less than 15.45 ac
River Corridor Improvements	Terracing and Multi-Use Trail	None	None	Terracing and Multi-Use Trail	Terracing and Multi-Use Trail
Entitlements	Re-zoning; PUD Amendment; TPM/LLA; and SPAR	None	SPAR	Re-Zoning, PUD Amendment; TPM/LLA/or TSM; and SPAR	Re-Zoning; PUD Amendment; TPM/LLA; and SPAR

Alternatives Considered but Not Further Studied

Rainier Connector Access Alternative

The 1982 PUD approvals for the existing Oak Creek Apartment project included the condition (3d) that, "All major accesses to future developments in the remaining vacant property in the vicinity of the project [i.e., APN -009] shall be from the Rainier Avenue extension or other new public street, rather than to streets to the south such as Graylawn Avenue and Burlington Drive." Additionally, the Project applicant has indicated (in response to the Notice of Preparation for the Rainier Cross Town Connector EIR), that access to the Project site could potentially be provided via the Rainier Avenue extension.

The City's current plans, as shown in the certified EIR for the Rainier Cross-Town Connector, indicate that no access from the Project site to the Rainier Connector is likely to be feasible. The Rainier Avenue Cross-Town Connector Project consists of a new 0.65-mile long, 4-lane arterial roadway connecting North McDowell Avenue on the eastern side of Highway 101 to Petaluma Boulevard North on the western side of the City. The Rainier Avenue extension would extend at-grade from the signalized North McDowell Avenue intersection, cross under Highway 101 beneath an elevated portion of the freeway that will be constructed as part of the Marin-Sonoma Narrows HOV project, and would cross over the SMART Corridor and Petaluma River on a bridge. After crossing the Petaluma River, the Rainier

Connector would land again at-grade at Petaluma Boulevard North, where it would terminate at a signalized T-intersection. The bridge structure would be approximately 88 feet wide, 508 feet in length, and would meet a minimum vertical clearance of 23 feet in height over the SMART Corridor tracks. The closest point where the bridge alignment would come to the Project site is in the immediate vicinity of the SMART corridor at the northern-most portion of the Project site. At this point, the Rainier Connector's bridge structure would be at least 23 feet above grade. The only feasible means of connecting the Project site to his bridge would be to construct a bridge ramp, up from the Project site, to form an above-grade intersection on the bridge. No such bridge ramp has been envisioned as part of the Rainier Cross-Town Connector project. Further, such a bridge ramp would connect to the Rainier Connector at an elevated portion of the bridge that would be in a curved alignment, making a right-angle intersection impossible.

The financial and technical challenges associated with constructing an extension of Graylawn Avenue as a bridge ramp that would extend through the Project site and ramp up to an intersection on the Rainier Cross-Town Connector are so substantial as to be considered remote and speculative, if not infeasible. For these reasons, access to the Project site via the Rainier Connector has not been further analyzed as part of this EIR.

Alternative Site Location

In considering the range of alternatives to be analyzed in an EIR, CEQA Guidelines state that an alternative site location should be considered when feasible alternative locations are available, and if significant effects of the project would be avoided or substantially lessened by putting the project in another location.

The Project applicant does control another, currently undeveloped location. The Project applicant also owns the approximately 49-acre property on the east side of the Petaluma River (opposite the Project site), and this property could be made available for future development. Future development of this alternative site would be consistent with the City's General Plan (this property has a General Plan land use designation of Medium Density Residential); could provide for new, relatively high-density residential development within the City of Petaluma's current Urban Growth Boundary; would add to the City's stock of available multi-family housing; could create a new housing development that is proximate to community resources; and could implement provisions of the Petaluma River Access and Enhancement Plan. Furthermore, development of this alternative site would not be dependent upon the Project's proposed Shasta Avenue (Sid) extension across the rail tracks.

Relocation of the proposed Project to this alternative location is possible. However, subsequent and more detailed analysis of this alternative site would be required before it could be determined whether this alternative site would effectively reduce or eliminate environmental impacts associated with the Project site, or whether it would likely result in similar impacts at this alternative site. This alternative location does not have frontage on any public street at this time, and potential development of this site is constrained by the floodway, floodplain, Deer Creek, and riparian and native vegetation. Future development at the alternative location immediately across the Petaluma River is not considered as part of this EIR, but separate environmental analysis of a separately proposed project at this location is not precluded.

Other Northerly Access

The 1982 PUD's Condition 3d provides that all major accesses to future developments in the remaining vacant property [i.e., APN-009] shall be from the Rainier Avenue extension or other new public street, rather than from streets to the south such as Graylawn Avenue and Burlington Drive. This prior

condition of approval, which was adopted approximately 35 years ago, could not have foreseen the design complications associated with accessing the Project site via the now currently proposed design for the Rainier Cross Town Connecter (discussed above and not included for further analysis). However, this condition also suggests access via “other new public streets”, but not streets to the south. Other than the Project’s proposed Shasta Avenue extension or a similar extension of roadways from the west and across the rail tracks (such as Cinnabar), the only other potentially viable direction from which access to the site may be accomplished is via a new bridge crossing of the Petaluma River from either the north or northeast. The Project does not propose any such new bridge, nor does the City’s General Plan Mobility Report. While it may be feasible to construct a new bridge, substantially smaller in design than the currently proposed Rainier Connector, any such bridge would most likely result in significant environmental impacts of its own. Furthermore, there is not currently any public access from the lands over the River, except to also cross Lynch Creek by bridge to connect to Burlington Drive; which Condition 3d states shall not be a major access point. Analysis of such impacts is well beyond the scope of this EIR, and would be dependent upon a separate, subsequent EIR specifically addressing this topic. Therefore, no further analysis or discussion of such an alternative access is included in this EIR.

Alternative #1: No Project – No Development

CEQA Guidelines section 15126.6(e)(3)(B) states that "If the project is…a development project on an identified property, the no project alternative is the circumstance under which the Project does not proceed." If the Project does not proceed, then several potential circumstances could occur, as described below.

Description

This alternative presumes only the development that could occur at the Project site without any discretionary action. Specifically if the provisions of the 1982 PUD that restrict use of the larger, northern majority of the Project site (APN-009) are not lifted, then this portion of the site would remain limited to those uses permitted in the Agricultural district as specified in the Petaluma Zoning Ordinance. These uses include crop production, horticulture, orchards, vineyards, keeping of farm animals, and one single-family dwelling unit. With no new approvals for development of this property, use of the APN-009 site would likely continue much as it is today, as a large and undeveloped private parcel. The No Project Alternative assumes development of 1 new single family home with accessory structures on the 4.39-acre APN-006 and on APN-009.

There are no such limiting PUD restrictions on the separate APN-006 parcel, and a separate development proposal for this site could be anticipated (see Alternative # 2, below). However, no such proposal has been brought to the City at this time. If the Project does not proceed, then any proposal for the individual APN-006 site would be a separate action, not a part of this Project. The APN-006 site would also remain as a privately owned undeveloped property, at least until a separate proposal for development may be brought forward.

With no development on either the APN-006 or -009 sites, the Shasta Avenue Extension to Graylawn Avenue would not occur, and the Project's proposed river terraced grading would not occur.

Environmental Analysis of Alternative #1

Under a No Project–No Development Alternative, existing environmental conditions on the entire 19.23 gross acres of the Project site would remain much as they are today. The aesthetics of the site would not change, and the existing oak woodlands and other mature riparian trees found in this upstream segment of the Petaluma River would not be removed or altered.

None of the Project's construction-period environmental impacts would occur. There would be no mass grading of the site, and the potentially for grading-related fugitive dust emissions or emissions from heavy grading equipment would not occur. No existing trees would be removed, no wetlands would be filled, no potential to disturb or uncover currently unknown cultural resources would occur, potential water quality effects due to sedimentation and increased pollution would not occur, and construction-related noise impacts would not affect the surrounding neighborhood.

Without new development, the No Project Alternative would not generate any new traffic, operational air quality emissions, or demands on public services and other utilities. A new crossing of the SMART rail tracks would not occur, and no new potential traffic safety hazards would be introduced. Without the rail crossing, there would be no additional train horn noise otherwise needed for such a crossing that could adversely affect the surrounding existing neighborhood. Without development on the site, the No Development Alternative would maintain those limitations of the 1982 Oak Creek Apartments Conditions of Approval, which limit future land uses on the APN -009 parcel to only those uses permitted in the Agricultural district.

This alternative would not implement those goals of the Petaluma General Plan which call for efficient development of underutilized infill sites with residential densities that are equal to or higher than that of surrounding land uses. The No Development Alternative would not provide a river trail as envisioned by the River Plan and General Plan. The No Development Alternative would also not result in implementation of terraced grading along the banks of the Petaluma River, and thus would have no effect on lowering the base flood elevations at the site or at other upstream locations, and would not assist in implementation of adopted City-wide ordinances and General Plan policies that seek to reduce flooding and floodplain impacts to the greatest extent feasible.

Alternative #2: APN-006 (Webb Parcel) Development Only

CEQA Guidelines Section 15126.6(e)(3)(B) states that "If disapproval of the Project under consideration would result in predictable actions by others, such as the proposal of some other project, this "no project" consequence should be discussed." This alternative is a representation of such a "predictable action" based on current General Plan, zoning and 1982 PUD restrictions.

Alternative #2 Description

The Project site consists of two primary parcels, plus other associated rights-of-way. Under Alternative #2, the potentially predictable actions that would likely occur at each of these primary parcels, if the Project were not approved, include the following:

APN-009 (being the northern and largest component of the Project site) is the vacant portion of the Oak Creek Apartment PUD. The 1982 PUD that enabled development of the existing 76-unit Oak Creek Apartments project (approved in 1982 by Resolution No. 9628) included a condition that use of the vacant remainder portion of the site (i.e., APN-009) be limited to uses permitted in the Agricultural District as specified in the Zoning Ordinance. The City's understanding is that the 1982 PUD eliminated development potential from the APN-009 parcel, until such time as a Re-Zoning occurs. Approving 76 units over 17.56 acres (the areas of Oak Creek Apartment APN-007 parcel and APN-009 with development potential) and restricting APN-009 to Agricultural use was the means used to consolidate 76 apartment units on just 5.83 acres, as the Residential land use designation then in effect allowed only 6 units to the acre, which would have permitted only 34 units over the 5.83 acre apartment site. The Oak Creek Apartment project staff report states that the remaining approximately 11.73 net acres with development potential at APN-009 is to remain vacant until a future Re-Zoning occurs. Thus, there is no development potential on the remainder APN-009 parcel, without a Rezoning. The current General Plan density allows between 8.1 and 18 dwelling units to the net acre and the proposed Project specifically seeks a Re-Zoning and an amendment to that 1982 PUD condition in order to now enable development of that remainder vacant property with residential uses at medium-scaled density (i.e., at 18 dwelling units per acre). Under Alternative #2, the Project's proposed PUD amendment and Re-Zoning would not be pursued, and use of APN-009 would be limited to only those uses permitted in the City's Agricultural District zoning.

APN-006 (being the southern and smaller component of the Project site) is an approximately 4.39-acre property that was not a part of the prior 1982 Oak Creek Apartment project PUD, and therefore is not affected by the PUD's provisions or conditions of approval. APN-006 has a current General Plan land use designation of Medium Density Residential, and is zoned Residential 4 (R4). The R4 zone identifies areas intended for a variety of housing types ranging from single dwellings to multi-unit structures, with densities ranging from 8.1 to 18 dwelling units per acre. At a maximum density of 18 units per acre, the gross 4.39-acre site at APN-006 could accommodate as many as 79 new residential units. At minimum densities of 8.1 units per acre, the site could accommodate 35 units. The General Plan calculates density based on the net acreage, which would be less any private or public access roads (curb to curb). For example, the proposed Project includes the Shasta Avenue at grade crossing through APN-006; curb-to-curb it occupies approximately 0.88 acres resulting in a development maximum of 63 units at APN-006. In the case of an apartment complex designed without roads, like the Oak Creek Apartments across Graylawn Avenue, no roadway area would be removed for the density calculation, and up to 79 units could be constructed.

Development Assumptions for Alternative #2

If the proposed Project were not approved (specifically, if a Rezoning was not approved and the conditions of the 1982 PUD were not amended to permit development at APN-009), a predictable outcome of not approving the Project would be a separate, individual project at APN-006. This site has street frontage on Graylawn Avenue, would not be dependent upon a Shasta Avenue extension across the rail tracks, and is unaffected by the constraints of the 1982 PUD. A residential project could be designed here that is consistent with current General Plan land use designations and zoning.

Alternative #2 is defined as an up to 79-unit, medium-density residential apartment project on APN-006, only. The development plan for the APN-006 site may be similar to the development plan for the existing 76-unit Oak Creek Apartment complex, which is immediately across Graylawn Avenue from the APN-006 site. However, whereas the Oak Creek Apartment complex contains 76 units on 6.3 net acres (or a density of approximately 12 units per acre), development at the APN-006 site would occur at a higher density of 18 units per acre. At this density, the 4.39-acre site could support development of up to 79 units. The Alternative #2 site could potentially also accommodate a community clubhouse and swimming pool, as proposed by the Project.

Access to Alternative #2 would be via existing Graylawn Avenue. The APN-006 site has more than 360 linear feet of frontage along Graylawn prior to the cul-de-sac terminus, more than adequate to develop a driveway connection into the site. This Alternative would not include a Shasta Avenue Extension to Graylawn across the rail tracks, but would be dependent upon an EVA connection to Bernice Court.

Consistency with the Petaluma River Access and Enhancement Plan

The River Plan provides that no subdivision, use permit, design review or other entitlement for land use shall be authorized for construction in the “designated River Corridor”, if that proposed action is not in substantial compliance with the Petaluma River Access and Enhancement Plan. Alternative #2 does not include any development on Parcel -009, which is the larger, 14.33 net acre portion of the Project site that is within the designated River Corridor. Parcel -006 (the southern or Webb parcel) is the only property to be developed under this Alternative, and it is not within the River Corridor. Thus, Alternative #2 would not be required to implement any of the City’s Petaluma River Access and Enhancement Plan objectives, including expanded river channel capacity improvements, the river trail, or river vegetation management and enhancement.

Environmental Analysis of Alternative #2

Aesthetics

Less than Significant Effects

In comparison to the Project, Alternative #2 would result in substantially less visual change and would further reduce the Project’s significant effects on scenic vistas, scenic resources and the existing visual character of the site. With all new development limited to the 4.39-gross acre APN-006, the 14.33-gross acre APN-009 would remain undeveloped and retained in open grassland with scattered oaks and other trees. These last remaining vestiges of the Petaluma River's oak woodlands and other mature riparian trees found in the upstream segment of the Petaluma River would not be removed or altered, most of the protected trees throughout the Project site would be retained, and the Petaluma River terracing project, which includes re-contouring the western bank of the Petaluma River channel that will unavoidably impact riparian areas and oak woodlands adjacent to the River, would not occur.

Light and Glare (Less than Significant with Mitigation)

Development of Alternative #2 would create new source of light or glare (though substantially less new sources than the Project), which could adversely affect day or nighttime views in the area. In order to ensure compliance with the regulatory requirements for glare as found in Chapter 21 section 21.010 of the IZO, development pursuant to Alternative #2 would be required to implement ***Mitigation Visual-4: Glare Minimization Design Standards***, to reduce light and glare at the Project site.

Air Quality

Less than Significant Effects

Because Alternative #2 would result in development activity on a substantially smaller site and with substantially fewer units that the Project, Alternative #2 would not result in air quality impacts that would be greater than those analyzed under the Project. As such, all air quality impacts found to be less than significant pursuant to the Project would either be similar to, or reduced as compared to the Project, and not discussed further. These less than significant impacts include:

- No conflicts with the applicable Clean Air Plan;
- Criteria Pollutant Emissions from Construction Activities (Less than Significant)
- Operational Air Quality Emissions (Less than Significant)
- Odors (No Impact)

Only those air quality effects that may remain potentially significant under Alternative #2 are further discussed below.

Construction Period PM10 Emissions (Less than Significant with Mitigation)

Alternative #2 could result in air quality impacts related to construction-period fugitive dust (PM10), but these impacts could be reduced with implementation of required mitigation measures. To address construction-period dust and PM10 emissions, Alternative #2 would be required to implement ***Mitigation Measure AQ-2A: Basic Dust Control***. Because Alternative #2 would be smaller than screening size for criteria pollutant emissions during construction, Mitigation Measure AQ-2B: Enhanced Dust Control would not be required. With implementation of MM AQ-2A, Alternative #2's construction period generation of PM10 would not violate air quality standards or substantially contribute to an air quality violation, and impacts to air quality from fugitive dust emissions would be reduced to levels below significance thresholds.

Construction-Period Toxic Air Contaminant Emissions (Less than Significant with Mitigation)

Construction of Alternative #2 would use heavy-duty off-road and on-road construction equipment that would produce emissions of toxic air contaminants. Emissions from these construction activities would likely exceed the off-site community risk and hazards threshold of significance. To address these construction-period emissions, Alternative #2 would be required to implement ***Mitigation Measure AQ-4: Construction Period Emission Reductions***. As indicated in the health Risk Assessment appended to this Draft EIR, implementation of the control measures identified in MM AQ-4 would reduce health risk impacts related to construction activities to levels that would be less than significant.

Biological Resources

As indicated in the description of Alternative #2, this alternative would not involve a property located within the Petaluma River Corridor, and thus would not be required to implement river bank terracing or river habitat management efforts, or to extend the river trail. Therefore, Alternative #2 would not result in any of the significant impacts associated with the Project's proposed/required riverbank terracing project (i.e., it would not disturb any river waters habitat below the ordinary high water mark of the Petaluma River, it would not adversely affect any seasonal wetlands that are located in proximity to the River, it would not remove any riparian habitat from along the banks of the River, and it would not need to remove any protected oak trees or other tree species from within the river's Riparian Preservation Zone; nor the scattered oaks or low value wetlands from APN-009.

Other Less than Significant Effects

Because Alternative #2 would result in development activity on a smaller portion of the Project site, Alternative #2 would not result in any impact to biological resources that would be greater than those analyzed under the Project. As such, biological resource impacts found to be less than significant pursuant to the Project would either be similar to, substantially reduced, or avoided as compared to the Project. These less than significant impacts include:

- No substantial adverse effect on candidate, sensitive or special-status plant species;
- Less than significant effects on special-status reptile, amphibian or fish species (existing conditions provide no special status species habitat on the uplands portion of the Parcel -006 site, including no suitable aquatic habitat for western pond turtle, no suitable breeding habitat for California red-legged frog, very low potential for California horned lizard, not within the potential range of California tiger salamander, and no suitable stream habitat for foothill yellow-legged frog or California freshwater shrimp);
- No direct removal or fill of any seasonal wetlands, as no wetlands have been identified specific to the APN-006 parcel;
- No potentially significant adverse effects on riparian habitat, as Alternative #2 would not include the Project's proposed terraced grading plan along the banks of the Petaluma River;
- No potential for adverse effects on aquatic habitat within the Petaluma River that could potentially interfere with the movement of native resident and migratory fish;
- No removal of trees from APN-009, including the 15 protected oaks, redwoods, and riparian box elders.
- Less than a significant increase in the presence of people or outdoor lighting associated with new development, that could interfere substantially with the movement of native resident or migratory wildlife species or with established native resident or migratory wildlife corridors along the Petaluma River;
- No impact related to conflicts with a Habitat Conservation Plan or Natural Community Conservation Plan, as no such plans apply to the Alternative #2 site.
- No impact related to the potential introduction of invasive non-native plants to the riparian corridor along the river, as the Alternative #2 site is not included in the River Corridor as described in the Petaluma River Access and Enhancement Plan.

Only those effects to biological resources that may remain potentially significant under Alternative #2 are further discussed below.

Special Status Bird Species (Less than Significant with Mitigation)

Although Alternative #2 would substantially reduce the number of trees to be removed from the site as compared to the Project and would not result in tree removal from the oak and riparian woodlands that exist on the Project site, Alternative #2 would require certain tree removal that could result in a substantial adverse effect on candidate, sensitive or special-status bird species. To address the potential for Project-related grading and construction activities to affect special status bird species, ***Mitigation Measure Bio-2a: Pre-Construction Nesting Surveys*** and ***Mitigation Measure Bio-2b: Pre-Construction Tree Roost Surveys***, would be required. Nesting surveys and the protection of any identified nests would prevent harm to special status bird species and would prevent harm to more common types of birds protected pursuant to the Migratory Bird Treaty Act, and would mitigate impacts to special status bird species to a level of less than significant.

Local Policies and Regulations: Tree Removal and Tree Protection (Less than Significant with Mitigation Measures)

Alternative #2 could conflict with local policies and ordinances protecting biological resources, including the City's tree preservation policies and ordinance. Approximately 41 of the 63 trees on the Project site that would be removed to accommodate the Project are located on the Alternative #2 site, and assumed removed under Alternative #2. Consistent with the City of Petaluma's Implementing Zoning Ordinance, Alternative #2 would be required to implement **Mitigation Measure Bio-11A: Further Preservation of Existing Trees**, ***Mitigation Measure Bio-11B: Protected Tree Replacements***, and ***Mitigation Measure Bio-11C: Tree Protection Plan***. With implementation of these mitigation measures, Alternative #2 would comply with City of Petaluma plans, policies and ordinances regarding protected trees and the impact would be reduced to a level of less than significant.

Spreading Sudden Oak Death (Less than Significant with Mitigation Measures)

Alternative #2 could result in removal of plant materials hosting Sudden Oak Death during tree removal, but would be substantially less likely to spread Sudden Oak Death to the Petaluma River riparian habitat. Implementation of ***Mitigation Measure Bio-12A: Infected Tree Identification, Mitigation Measure Bio-12B: Tree Removal Precautions*** and ***Mitigation Measure Bio-12C: Debris Removal Precautions*** would be required, consistent with regulations addressing the handling and transport of horticultural plant stocks within and between counties and would reduce the environmental impacts associated the possible spread of sudden oak death to a level of less than significant.

Cultural Resources (Less than Significant with Mitigation)

Like the Project, Alternative #2 has limited potential to affect, either directly or indirectly, the significance of a historical resource. Although investigations of the site did not encounter any significant archeological resources, the cultural resource report indicates that areas located along the banks of the Petaluma River are known to have been occupied by the Coast Miwok, and have a heightened potential for archeological resources to be present below grade. Alternative #2 is setback from the river and the potential discovery of such resources is therefore less likely, but the potential remains. Similarly, areas like the Project site, with alluvium soil deposits in close proximity to rivers, have been known to contain vertebrate fossils. Alternative #2 is well removed from the river and the potential discovery of fossil resources is therefore less likely, but this potential remains. It is also possible that ground-disturbing activities associated with site preparation, grading and excavation for Alternative #2 could disturb as-yet unknown human remains, potentially including Native American human remains.

The potential to uncover buried cultural resources is less likely under Alternative #2 than under the Project because of its further distance from the River and its smaller overall site area. However, the potential for future discovery remains, and mitigation measures recommended for the Project, including ***Mitigation Measure Cultural-1: Monitoring of Well Abandonment, Mitigation Measure Cultural-2: Discovery of Unknown Archaeological Resources, Mitigation Measure Cultural-3: Discovery of Unknown Paleontological Resources*** and ***Mitigation Measure Cultural-4: Discovery of Human Remains***, would also apply to Alternative #2. Implementation of the mitigation measures is consistent with the provisions of California Health and Safety Code, and would serve to ensure that ground-disturbing activities do not adversely affect as-yet undiscovered cultural resources.

Geology

Less than Significant Effects

Because Alternative #2 would result in development activity on a substantially smaller site and with substantially fewer units that the Project, Alternative #2 would not result in geologic impacts that would be greater than those analyzed under the Project. As such, all impacts related to geologic hazards or conditions found to be less than significant pursuant to the Project would either be similar to, or reduced as compared to the Project. These less than significant impacts include:

- Less than significant effects related to surface fault rupture, as no faults are mapped across the Project and the risk of ground rupture within the Project boundaries is considered very low;
- Less than significant effects related to liquefaction, based on detailed studies that indicate no potential for liquefaction within the development areas of the Project site;
- Less than significant effects related to landslides, because those portions of the Project site developed pursuant to Alternative #2 are generally flat and present no potential for landslide hazards. Alternative #2 would not include terracing along the Petaluma River, where bank instability may be encountered;
- No impact related to reliance on appropriate soil capabilities to support the use of septic tanks, as this Alternative would utilize the municipal sewer system present in the area;
- No impact related to the loss of mineral resources, as there are no known mineral resources on the site and no designated mineral resource sectors within the Project site or its vicinity.

Only those geologic effects that may remain potentially significant under Alternative #2 are further discussed below.

Exposure to Strong Seismic Ground Shaking (Less than Significant with Mitigation)

Alternative #2 could expose people or structures to potentially substantial adverse effects involving strong seismic ground shaking. Similar to the surrounding region, there is likely to be at least strong seismically-induced ground shaking at the Alternative #2 site from an earthquake on the Roger's Creek-Healdsburg, Hayward, San Andreas, or Maacama Faults. Pursuant to existing regulatory requirements, the following mitigation measures would be required of Alternative #2: ***Mitigation Measure Geo-2A: Compliance with California Building Code*** and ***Mitigation Measure Geo-2B: Incorporation of Geotechnical Investigation Recommendations***. Incorporation of seismic construction standards as required by these regulatory requirements would reduce the potential for catastrophic effects of ground shaking, but would reduce the hazards to a level considered acceptable by the state of California for reducing seismic risks to acceptable levels, and therefore to a level of less than significant.

Expansive Soils (Less than Significant with Mitigation)

Portions of the Alternative #2 development site may contain localized expansive soil, creating substantial risks to property. The impacts of expansive soils can be mitigated by grading and/or foundation measures that may be applicable to portions or all of the Alternative #2 site, including ***Mitigation Measure Geo-5A: Soil Treatment*** and ***Mitigation Measure Geo-5B: Foundation Design***. Implementation of the above mitigation measures will reduce the potential impact of expansive soils to less than significant levels.

Soil Erosion (Less than Significant with Mitigation)

Although much less ground disturbance would be required under Alternative #2 than under the Project, grading activities for Alternative #2 would involve disturbing and removing topsoil. During this earthwork activity, topsoil could be mobilized by storm waters and wind, and increase sediment loads in waterways. To address potential erosion impacts associated with the Alternative #2, ***Mitigation Measure Geo-6: Erosion Control Plan*** would be required, in accordance with the City of Petaluma's Subdivision Ordinance and its Grading and Erosion Control Ordinance. Implementation of these measures would reduce the potential impact of soil erosion to a level of less than significant.

GHG Emissions

Less than Significant Effects

Because Alternative #2 would result in development activity on a substantially smaller site and with substantially fewer units that the Project, Alternative #2 would not result in GHG emissions greater than those analyzed under the Project. As such, all impacts related to GHG emission, which were found to be less than significant pursuant to the Project, would be reduced under Alternative #2 as compared to the Project. These less than significant impacts include:

- Less than significant emission of construction-related greenhouse gas emissions, which were calculated for the Project to fall below the threshold of significance (1,100 MT CO2e/year),
- Less than significant emissions of operational sources of greenhouse gasses from direct and indirect sources. Estimated operational greenhouse gas emissions for the Project were calculated at 2,359 metric tons of CO2e per year. Assuming that GHG emissions are roughly proportional to unit count, Alternative #2 (at 84 units) would have approximately 30% of the number of residential units as compared to the Project, and could be assumed to generate approximately 30% of GHG emission, or approximately 702 MT CO2e/year, less than the 1,100 MT CO2e threshold. Additionally, BAAQMD screening criteria from the 2011 CEQA Guidelines indicates that projects below applicable screening criteria would not likely exceed the threshold. For low- to mid-rise apartment project, the screening size is between 78 and 87 dwelling units. Alternative #2, at 84 units, is within that screening size range where projects are assumed to generate less than threshold levels of GHG emissions.

Hazards

Less than Significant Effects

Because Alternative #2 would result in development activity on a substantially smaller site and with substantially fewer units that the Project, Alternative #2 would not result in hazards or hazardous materials impacts that would be greater than those analyzed under the Project. As such, all impacts related to hazards or hazardous materials found to be less than significant pursuant to the Project would either be similar to, or reduced as compared to the Project. These less than significant impacts include:

- Compliance with applicable regulations will ensure that construction and operation of the Project will not create a significant hazard to the public or the environment through the routine transport, use, or disposal of potentially hazardous materials.
- Required compliance with all federal state and local regulations regarding use, handling and storage of hazardous materials will minimize the risk of accidental upset or spill.
- Regulatory measures that prevent spills and provide corrective actions be taken in the event of a spill also ensure that construction related hazardous materials do not pose a threat to schools located within ¼ mile.

Only those hazards and hazardous material impacts that may remain potentially significant under Alternative #2, or that are substantially different than the conclusions indicated for the Project are further discussed below.

Registered Hazardous Materials Sites (Less than Significant with Mitigation)

No portion of the Project site, including the Alternative #2 site, is included on a list of hazardous materials sites, including the DTSC's EnviroStor database and the SWRCB's GeoTracker database. However, a Phase I ESA report recommends that the surface soil at the site be tested for pesticides prior to development because of the former agriculture use. Implementation of ***Mitigation Measure Haz-1: Soil Testing and Regulatory Compliance***, would address the potential for residual pesticides, and the impacts regarding hazardous materials exposure will be reduced to a level of less than significant.

Hazardous Conditions - Increased Presence along Rail Tracks (Less than Significant with Mitigation Measures)

Like the Project, Alternative #2's westerly boundary is parallel and immediately adjacent to the SMART railroad right-of-way. The increased presence of residents and visitors in an area immediately adjacent to the rail tracks would result in a greater potential for rail-related accidents along this portion of the line. Alternative #2 would require implementation of ***Mitigation Measure Haz-5: Fencing*** to include appropriate fencing along the edge of and parallel to the rail tracks. Construction of appropriate fencing along the Project's frontage to the rail tracks would reduce safety hazards associated with access onto the railroad right-of-way to a level of less than significant.

Hazardous Conditions – Rail Crossing (No Impact)

Unlike the proposed Project, Alternative #2 does not include a new at-grade crossing of the SMART railroad right-of-way. Without the at-grade crossing, this alternative would not enable traffic, bicycle or pedestrian crossings of the rail tracks that would increase the possibility of train collisions and train-related accidents. Thus, Alternative #2 would have no impact due to a hazardous at-grade rail crossing.

Emergency Access (No Impact)

Alternative #2's primary access would be from Graylawn Avenue. Petaluma Fire Code requires multiple-family residential projects having more than 50 dwelling units to be provided with two separate and approved fire apparatus access roads. Therefore, Alternative #2 (like the Project) would include a secondary means of access via a public access easement at the existing frontage at the end of Bernice Court. The Bernice Court connection would be an emergency vehicle access (EVA) only, and not as a through street, and is designed to meet all fire apparatus, turning radius and turnaround requirements of the Petaluma Fire Code. The Petaluma Fire Department has reviewed this proposed EVA route and found it to provide acceptable emergency access to the site.

Hydrology

Because Alternative #2 would result in development activity on a substantially smaller site and with substantially fewer units that the Project, Alternative #2 would not result in hydrology or water quality impacts that would be greater than those analyzed under the Project. As such, all impacts related to hydrology and water quality found to be less than significant pursuant to the Project would either be similar to, or reduced as compared to the Project. These less than significant impacts include:

- Alternative #2 would not place any new housing or create any new habitable space on the first floor of a new building that is located with a regulated floodplain (i.e., within a 100-year flood hazard area as defined on applicable FEMA Flood Insurance Rate Maps).
- Alternative #2 would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site, nor would it create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems. Unlike the Project, Alternative #2 would likely be connected to the City's storm drainage system, with ultimate outfall into the Petaluma River.
- Alternative #2 would not draw upon or otherwise reduce groundwater resources.
- The Alternative #2 site is not located in an area that would expose persons to inundation by seiche, tsunami, or mudflow, and is a site that is nearly level and not in proximity to any large lake or the ocean.

Only those hydrology and water quality impacts that may remain potentially significant under Alternative #2 or that are substantially different than the conclusions indicated for the Project, are further discussed below.

Increased Pollution, Erosion and Siltation during Construction

Construction activity associated with Alternative #2 would cause a temporary increase in the potential for soil loss and erosion, and an increase in sediment and polluted runoff delivered to the Petaluma River due to soil disturbance and grading. The operation of large construction equipment could also result in the contribution of petroleum hydrocarbons and heavy metals in construction-period stormwater runoff. Alternative #2 would not include river terracing and associated grading within the river banks, and so would not expose newly graded and exposed floodplain terraces, and would have less potential to contribute fine sediment and silt directly to the river. To address construction-period erosion and siltation, as well as the introduction of construction-related sources of water pollution, Alternative #2 would similarly be required to demonstrate compliance with all applicable regulatory requirements, including:

- Filing a Notice of Intent (NOI) with the RWQCB for compliance with the NPDES General Construction Activities Permit;
- Preparation of a site-specific Storm Water Pollution Prevention Plan (SWPPP) per NPDES general construction permit requirements, including all BMPs as identified in Mitigation Measure Hydro-1: SWPPP Requirements;
- Preparation of an Erosion Control Plan to be reviewed and approved by the City of Petaluma prior to issuance of a grading permit;

When properly designed, and implemented, compliance with regulatory requirements and mitigation measures would reduce Alternative #2's effects on the quality of storm water runoff from construction to less-than-significant levels.

Operational Water Quality

The long-term operation of Alternative #2 would contribute to the levels of non-point sources of pollutants and litter entering downstream waters, including the Petaluma River and the San Francisco Bay. An increase in non-point sources of pollutants could have adverse effects on wildlife, vegetation, and human health. Similar to other projects within the City, Alternative #2 would also be required to comply with the NPDES General Permit for the Discharge of Storm Water from Small MS4s, including the incorporation of site design measures, source controls, stormwater treatment measures, and/or other low impact development (LID) measures to reduce stormwater runoff and limit the transport of pollutants to receiving waters. Alternative #2 would be required to prepare a Storm Water Control Plan (SWCP) that shows how site drainage would be treated either through bio-filters located in open areas and parking lot swales, or through self-treating areas. Additionally, Alternative #2 would be required to implement ***Mitigation Measure Hydro-2A and -2B***, demonstrating design, construction and implementation (including monitoring and maintenance) of appropriate post-construction stormwater treatment measures to reduce water quality and hydromodification impacts to downstream reaches, as required by the current post-construction controls requirements of the Small MS4 General Permit. These regulatory requirements and mitigation measures would reduce effects on the quality of storm water runoff from Alternative #2 during operation to less-than-significant levels.

River Terracing

As described in the description of this alternative, Alternative #2 would not be required to implement riverbank terraced grading, and would not substantially alter the course of the Petaluma River in a manner that could cause increased risk or severity of on-site or off-site flooding. Alternative #2 would not provide for the reduction in the surface elevation of floodwaters, as would occur under the Project's river terracing plan.

Land Use

Dividing and Established Community

No physical elements of Alternative #2 would substantially reduce mobility or access to, or through the surrounding community. This alternative would involve construction of a relatively small residential complex on a vacant site located on the periphery of an area that has previously been developed for residential use.

Conflict with Plans and Policies

The residential density pursuant to Alternative #2 would achieve General Plan goal 1-P-1 for the site, which encourages the efficient development of underutilized lands through infill that is equal to or higher than that of surrounding land uses, and would be consistent with the Medium Density land use designation of the site as shown on the General Plan Land Use Map. Alternative #2 would result in a residential density of approximately 18 units per acre, consistent with the City's General Plan 2025 land use designation for the selected property.

The Alternative #2 development site is zoned R-4, which is "intended for a variety of housing types ranging from single dwellings to multi-unit structures." Densities range from 8.1 to 18.0 units per acre. Alternative #2, at a density of 18 units per acre, is consistent with the R-4 zoning district and would implements the Medium Density Residential land use classifications of the General Plan.

The Alternative #2 site is not within the previously approved Oak Creek PUD. Development of this property is not subject to the 1982 Oak Creek Apartments Conditions of Approval, which limit future land uses on the adjacent parcel (APN 009) to only those uses permitted in the Agricultural District.

Regulations for the Floodway and Floodplain Districts are not applicable to the Alternative #2 site, as it is not proximate to the River. The River Plan is not applicable to the Alternative #2 APN-006 site.

Conflict with a Conservation Zone

No formal habitat conservation plans or natural community conservation plans have been adopted within the City of Petaluma. The conservation goals set forth in the City's Petaluma River Access and Enhancement Plan do not apply to the Alternative #2 site, as it is not a riverfront parcel.

Noise

Because Alternative #2 would result in development activity on a substantially smaller site and with substantially fewer units that the Project, Alternative #2 would not result in new noise impacts that would be greater than those analyzed under the Project. As such, all impacts related to new noise sources found to be less than significant pursuant to the Project would either be similar to, or reduced as compared to the Project. These less than significant impacts include:

- Noise due to the use and occupation of the site by new residences would not is not significantly increase or alter the existing noise environment.
- Traffic generated by this Alternative would not result in a substantial, permanent increase in ambient noise levels in the vicinity, such that traffic noise would exceed "normally acceptable" noise levels at nearby land uses.

Only those noise impacts that may remain potentially significant under Alternative #2, or that are substantially different than the conclusions indicated for the Project, are further discussed below.

Land Use Compatibility

Like the Project, Alternative #2 would expose new residents to reasonably foreseeable future train noise levels in excess of the 60 dBA Ldn threshold established by the FTA for outdoor use in residential areas affected by transit projects. Existing and future noise levels at the Alternative #2 site will be considered "conditionally acceptable" for multi-family residential uses. Consistent with ***Mitigation Measure Noise-1A: Achieve "Conditionally Acceptable" Noise Levels*** and ***Noise-1B: Noise Insulation***, the design of Alternative #2 would need to be no closer than 54 feet from the railroad tracks, or provide a non-permeable fence or wall along the length of the railroad tracks that provides a minimum of 5 dBA reduction in train noise, and the design of new residential units shall provide specific noise insulation to achieve interior noise levels of 45 dBA or lower. These measures would be capable of reducing anticipated noise conditions inside buildings to a level of less than significant.

Train Vibration

Like the Project, Alternative #2 would expose new residents to reasonably foreseeable vibration levels in excess of the threshold established by the FTA and FRA for residential uses. This Alternative could accommodate ***Mitigation Measure Noise-2: Avoidance/Vibration Attenuation Measures*** that ensures residential buildings are constructed no closer than 100 feet from the railroad tracks. This mitigation reduces ground-borne train vibration from being transmitted into the structures to a less than significant level, but may restrict the development potential of portions of the site.

Train Horn Noise

Alternative #2 would expose new residents to reasonably foreseeable future noise from train horns. Much of the Alternative #2 site is exposed to "severe impact zone" (in excess of 60 dB Ldn) of train warning-horn noise from the Payran crossing. Noise from the train- warning horn at the Payran crossing is not attributable to development of this Alternative, but would affect the site and its new residents. Noise from the train-warning horn exceeds the 60 dB Ldn threshold and the City of Petaluma's noise impact criteria, and this noise level is considered a significant impact. In an effort to reduce the frequency of the sounding of train horns, the City has established "Quiet Zone Standards" with SMART at all existing crossing within Petaluma. Thus, the sounding of train horns is not required, but permitted at the SMART train operator's discretion for railroad or safety reasons. Still, the Quiet Zone designation does not apply to freight trains and train horns will continue to be sounded with the crossing of some SMART trains. ***Mitigation Measure Noise-1B (Noise Insulation***) would apply to this Alternative, requiring specific noise control treatments to achieve interior noise levels of 45 dBA or lower e.g., sound rated windows and doors, sound-rated wall construction, acoustical caulking, protected ventilation openings, stucco siding, thicker walls, bedroom orientation, etc.). Implementation of this measure would reduce noise impacts from existing train horns, but not to a less than significant level.

Unlike the Project, Alternative #2 would not expose existing and new residents to the additional train horn noise from trains crossing the proposed Shasta Avenue Extension crossing. Alternative #2 would not be required to seek a "Quiet Zone" designation for the Shasta Avenue crossings pursuant to Mitigation Measure Noise-3.

Construction Noise Impacts

Construction of Alternative #2 would result in temporary but periodically significant construction noise impacts. The Alternative #2 site is close to the existing Oak Creek Apartments, as well as neighbors along Bernice Court, Graylawn Avenue and Jesse Avenue. Construction of this Alternative could expose these neighbors to construction noise that may occur for a year's duration. With required conformance with the City of Petaluma Noise Ordinance and implementation of construction-period noise mitigation measures (***Mitigation Measures Noise-4A: Construction Hours, -4B: Construction Engine Controls, -4C: Stationary Equipment and Staging, -4D: Miscellaneous Construction Noise, -4E: Noise Barriers, and -4F: Noise Disturbance Coordinator***), the majority of construction-period noise impacts would be reduced to a level of less than significant. However, because the period of construction activity may occur for a period of more than 1 year, and because certain construction activities resulting in noise levels exceeding 90 dBA Leq are expected to occur as near as 30 feet from the nearest existing sensitive receptor and may not be able to be effectively attenuated to acceptable levels (i.e., 80 dBA) with use of available noise reduction strategies, construction noise effects on these most nearby neighbors is conservatively considered to be ***significant and unavoidable.***

Traffic and Transportation

As indicated in the description of Alternative #2, this alternative would only involve development of a portion of the Project site that is not subject to the 1982 PUD restrictions regarding use of Graylawn Avenue for access, and would be a substantially smaller development that the Project. Using the same trip generation rate as applied to the Project, a 79-unit apartment project could be expected to generate approximately 514 daily vehicle trips, 41 AM peak hour trips and 49 PM peak hour trips. This represents approximately 30% of the trips assumed as generated by the Project.

Less than Significant Effects

Because Alternative #2 would result in approximately 30% of the vehicle trips as compared to the Project, Alternative #2 would not result in any traffic or transportation impacts that would be greater than those analyzed under the Project. As such, traffic and transportation impacts found to be less than significant pursuant to the Project would either be similar to, substantially reduced, or avoided as compared to the Project. These less than significant impacts include:

- The addition of traffic generated under Alternative #2 to existing traffic conditions would not cause a level of service standard established by the City of Petaluma to be exceeded at any study area intersections.
- The addition of traffic generated under Alternative #2 to "Pipeline" traffic conditions would not make a significant contribution of traffic under the Pipeline scenario, and the Project's impacts would be less than significant.
- Traffic generated by Alternative #2 would not cause a freeway segment operating at LOS E or better to deteriorate to LOS F, and would not cause an increase in traffic on a freeway segment already exceeding LOS E by more than one percent of the freeway segment's design capacity, under Existing, Pipeline or cumulative conditions.
- Alternative #2 would not result in a significant unanticipated increase in transit patronage beyond the system's current capacity, but potentially could result in development that is not appropriately accessible to transit riders (defined as within one-quarter mile of a transit stop).
- The design of Alternative #2's on-site circulation is presumed to be capable of adequately accommodating emergency vehicles accessing and circulating within the site.

Only those traffic and transportation effects that may remain potentially significant, or that are substantially different than the Project under Alternative #2, are further discussed below.

Cumulative Plus Project Intersection Level of Service

Pursuant to the Petaluma General Plan's Goal 5.3, a grid of streets will be developed near Petaluma Boulevard adjacent to the Rainier Avenue extension. A key element of this planned grid street system includes a Shasta Extension to Rainier, that would arc northward on the west side of the SMART rail tracks to a new intersection connection at Rainier Avenue. Under a Cumulative scenario (without Alternative #2), buildout of the General Plan would cause the Petaluma Boulevard North/Shasta Avenue intersection (which currently operates at LOS A during both AM and PM peak periods), to operate at LOS F in the PM peak hour. Because Alternative #2 would add at least one vehicle trip to this intersection (even without the Shasta Avenue Extension to Graylawn and its at-grade crossing) it would contribute to this cumulative impact. Alternative #2 would be required to make a fair share contribution towards this intersection improvement, pursuant to Mitigation Measure Transp-3: Petaluma Boulevard/Shasta Avenue based on its fair share of the aggregate costs of roadway improvements. Fair-share costs attributable to Alternative #2 are expected to be approximately 1%.

Emergency Vehicle Access

Alternative #2 would not substantially increase roadway hazards, as it would not include the Project's proposed Shasta Extension to Graylawn from west of the SMART rail tracks that includes an at-grade crossing. Emergency vehicles would be able to approach the Project site using both Graylawn Avenue and a secondary emergency vehicle access (EVA) via a connection to the end of Bernice Court. Improvement of the Bernice Court frontage would need to provide an acceptable fire apparatus

roadway meeting all turning radius and turnaround requirements of the Petaluma Fire Code to meet emergency access requirements. This impact would be less than significant.

Local Roadway Capacity

Alternative #2 would not cause an increase in traffic volumes on Graylawn Avenue that would exceed the capacity and street design standards established by the City of Petaluma. According to the Petaluma General Plan 2025 Mobility Report, Graylawn Avenue is identified as a local residential road. Pursuant to the Street Standards for the City of Petaluma, local residential roadways are intended to carry up to a maximum average of up to 2,000 daily traffic trips (ADT). Based on roadway counts collected in November 2015, Graylawn Avenue currently carries 954 vehicles per day. Adding all of Alternative #2's projected 514 vehicles to Graylawn Avenue would result in a total of 1,468 vehicles using Graylawn Avenue on an average day. Based on this assessment, the additional vehicle trips Attributed to Alternative #2 would be accommodated within the 2,000 vehicles per day design standard for a local residential road, and this Alternative would not cause this standard on Graylawn Avenue to be exceeded.

This alternative would not result in construction of the Shasta Avenue Extension to Graylawn, and thus would not contribute vehicle trips to Shasta Avenue on the west side of the rail tracks.

Pedestrian and Bicycle Circulation

Based on the General Plan 2025 Mobility Report's goals and policies, walking distance greater than one-quarter mile (approximately a five to 10-minute walk) from a residential neighborhood to a retail center or transit are undesirable. Because Alternative #2 does not include a rail crossing at the Shasta Extension to Graylawn, walking distance from the Project site to retail and transit services would be approximately one-half mile along Graylawn to Payran, and would require pedestrians to cross the rail tracks at Payran Street. ***Mitigation Measure Transp-9C: At-Grade Rail Crossing Safety Measures at Payran Avenue*** would be required to provide the residents of Alternative #2 with safe and effective pedestrian and bicycle access to retail and transit facilities.

Construction Traffic

The duration of the construction period associated with Alternative #2 would be substantially less than that assumed for the Project, but could still cause temporary disruption to the transportation network. ***Mitigation Measure Transp-13: Prepare Construction Management Plan*** would be required to address temporary construction impacts surrounding the Project site.

Utilities

Less than Significant Effects

Because Alternative #2 would result in development activity on a substantially smaller site and with substantially fewer units than the Project, Alternative #2 would not result in any demands on public utilities and services that are greater than those analyzed under the Project. As such, all impacts related to utilities, which were found to be less than significant pursuant to the Project, would be reduced under Alternative #2 as compared to the Project. These less than significant impacts include:

- There are sufficient water supplies available to serve Alternative #2 from existing entitlements and resources, and new or expanded entitlements are not needed. Alternative #2 will add to the cumulative demand for overall water supplies, and contribute to projected dry year water shortages. Therefore, this Alternative would be required to include water conservation strategies

that reduce overall water demands to levels projected to be sustainable on a cumulative basis, and would be subject to water shortage contingency plans that are now in place, and as may be implemented in the future.

- Wastewater generated by Alternative #2 would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board, would not necessitate construction of new or expanded wastewater treatment facilities, or result in a determination by the wastewater treatment provider that it has inadequate capacity to serve this Alternative's projected wastewater treatment demand in addition to existing commitments.
- Alternative #2 may require construction of new storm water drainage facilities or the expansion of existing facilities, but the construction of these facilities would not cause significant environmental effects. All storm drainage infrastructure that may be necessary to serve Alternative #2 would be required to comply with all provisions of the Petaluma Stormwater Management and Pollution Control Ordinance, including requirements for the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) and a Stormwater Management Plan (SMP).
- Alternative #2 would be served by a landfill with sufficient permitted capacity to accommodate its solid waste disposal needs.

Other Less than Significant Effects

In July 2007, the City of Petaluma issued a Notice of Preparation of this Draft EIR, which included a full CEQA Checklist identifying those environmental issues associated with the Project that were determined to be less than significant. Since Project-related impacts pertaining to the following CEQA topics were determined not to be significant for the Project, and because Alternative #2 is on the same site and would result in fewer residential units than the Project, the Initial Study Checklist conclusions regarding the following environmental issues would also be less than significant pursuant to Alternative #2:

- The site has not been in agricultural use for more than 30 years, and residential development pursuant to Alternative #2 would not convert any Farmland to non-agricultural use. The site is not zoned for agricultural use, and is not under a Williamson Act contract. No portion of the area surrounding the site is in active agricultural or timberland use, and development of this Alternative would not jeopardize the viability of any existing agricultural or timberland operations.
- The site is located within the urban boundaries of the City of Petaluma and does not abut wildlands. There are no wildland areas in the Project site vicinity, and the Project would therefore not result in any exposure of people or structures to risk of loss, injury or death involving wildland fires.
- The site is not located near any private airstrip, and the nearest airport is the Petaluma Municipal Airport located 2 miles to the east. The site is not included within the Airport Land Use Plan including the "conical zone" approach area, and development of the site would not result in a safety hazard for people working or residing in the area.
- At the City's average population density of 2.6 persons per household, this 79-unit alternative could be expected to add approximately 206 new residents to Petaluma's population. This level of population growth is not considered substantial in comparison to Petaluma's estimated population of 61,166 people, according to ABAG's population estimates for the Petaluma Sub-Regional Study Area.
- The only infrastructure improvements to be constructed pursuant to this alternative would be those necessary to enable development of the site, and would not be available to support or induce additional growth or development in the surrounding area.

- There are no existing housing units or residences on the site, and development of this alternative would not displace any existing housing units or people.
- Development of this alternative would increase the service demands of the Petaluma Fire Department and Police Department, but would not require construction of additional fire or police stations, or the expansion of any existing facilities to serve this Alternative effectively.
- Development of this Alternative would increase the number of students attending public schools, but would not require construction of new schools beyond that already anticipated. The developer of this Alternative would be required to pay all applicable school impact fees.
- This Alternative would increase use of parks and recreational facilities, but would not require construction of new parks or recreational facilities beyond those already anticipated.

Alternative #3A: Redistributed Density as Single-Family Lots

Description

Another development alternative for the Project site can be envisioned by which the potential residential densities as calculated for Alternative #2 (a total of 79 units on the APN-006 parcel, only) could be less densely distributed throughout the entire Project site, rather than as a higher density project located on APN-006 only. The premise of this alternative is similar to the 1982 Oak Creek Apartment project PUD, which effectively transferred densities from the APN-009 site to the APN-007 site. Under this Alternative #3A, a portion of the unit number possible on the APN-006 site would be redistributed to the APN-009 site, likely through a new PUD.

Alternative #3A would involve a re-zoning of parcels APN-006 and -009 to a new PUD zone for a single-family residential development, and shifting units from the -006 parcel to the -009 parcel, as well as clarifying revisions to the Oak Creek Apartment PUD. Rezoning to conventional R3 zoning might also serve to accommodate the described Alternative. A Lot Line Adjustment, Tentative Parcel Map or Tentative Subdivision Map, as well as Site Plan and Architectural Review would also be required. The density of up to 79 units spread over APNs -006 and -009 would yield a density of 5.1 units per gross acre, which is below the 8.1 units per net acre minimum density of the current Medium Density Residential land use category. However, a General Plan Amendment does not appear necessary as General Plan Policy 1-P-4 states that an exception to the minimum density may be considered in the case where minimum development yield is constrained by a pre-existing PUD. Should the decision makers prefer, Alternative #3A could include a General Plan Amendment either designating the development area to a lower residential density, or designating sensitive portions of APN-009 to Open Space (although alternative means of removing environmentally sensitive lands from the development area exist, such as retaining these areas within the Oak Creek Apartments PUD to the point where the development area density calculation attains 8.1 dwelling units/net acre).

Development Assumptions for Alternative #3A

The total net developable portion of the entire Project site (as defined for the Project) is approximately 15.45 acres, representing the combined total developable land within both the APN-006 and -009 parcels. Distributing a maximum development potential of 79 units across this net developable area would result in an average density of slightly greater than 5.1 units per estimated gross developable acre.

This Alternative assumes the entire Project site (excluding the floodway area and existing easements) is developed with lower-density single-family residential lots. Excluding the 2.02 acres of floodway and 1.76-acres of existing access easements from the 19.23-acre gross site area results in a developable area of approximately 15.45 acres. Assuming that approximately 20% of the developable area (or approximately 3.1 acres) is used for roads, sidewalks and other public uses, the remaining approximately 12.35 acres of developable area could accommodate new residential lots. Subdividing these 12.35 net developable acres into 79 individual single-family residential lots would yield an average lot size of approximately 6,800 square feet. Thus, the conceptual design for this Alternative would be a subdivision comprising 79 lots of approximately 6,800 square feet per lot (smaller lots if the design includes amenity or retention of environmentally sensitive land). Under this design, Alternative #3A would occupy relatively the same overall land area as the proposed Project. The development area could also accommodate a community clubhouse and swimming pool similar to that proposed by the Project, though it need not do so. This design for Alternative #3A would be similar to the existing single-family

residential neighborhoods to the immediate south and east of the Project site along Graylawn Avenue, Cordelia Drive and Jess Avenue.

Site Access

Primary access for Alternative #3A would be via existing Graylawn Avenue. The traffic load on Graylawn Avenue that would result from Alternative #3A would be similar to the traffic load generated by Alternative #2. The number of new trips generated by this alternative would be generally consistent with the intent of the 1982 PUD, which effectively limited development on the APN-009 property but did not materially affect trips generated from the APN-006 property. This Alternative would not include a Shasta Avenue extension across the rail tracks, but would be dependent upon an EVA connection to Bernice Court.

Consistency with the Petaluma River Access and Enhancement Plan

According to the River Plan, no subdivision, use permit, design review or other entitlement for land use shall be authorized for construction in the "designated River Corridor", if that proposed action is not in substantial compliance with the Petaluma River Access and Enhancement Plan." Alternative #3A would re-distribute residential densities from the -006 Parcel to the -009 Parcel, which is within the designated River Corridor. Thus, Alternative #3A would be required to implement the City's Petaluma River Access and Enhancement Plan objectives, including expanding the river channel capacity with the terraced grading plan as developed for the Project, as well as the river vegetation management and enhancement requirements as proposed under the Project's Habitat Management and Monitoring Program.

Environmental Analysis of Alternative #3A

Aesthetics

Less than Significant Effects

Similar to the Project, Alternative #3A could result in significant aesthetic environmental effects related to scenic vistas, scenic resources or the existing visual character or quality of the site and its surroundings. New single-family residential development pursuant to Alternative #3A would primarily be developed within the upland portion of the Project site, removing open grassland and certain scattered oaks and other trees. Alternative #3A would also include the River terracing flood control project that would re-contour the western bank of the Petaluma River channel. It is presumed that a single-family lot subdivision could be designed such that no residential development would encroach into the Petaluma River Plan Corridor, and that the last remaining vestige of oak woodlands and other riparian trees marking the location of the River would be preserved. However, Alternative #3A would result in removal of oaks and other protected trees throughout the site, in similar numbers of tree removal to that of the Project.

Light and Glare (Less than Significant with Mitigation)

Development of Alternative #3A would create new sources of light and glare similar to that of the Project, which could adversely affect day or nighttime views. In order to ensure compliance with the regulatory requirements for glare as found in Chapter 21 section 21.010 of the IZO, development pursuant to Alternative #3A would be required to implement ***Mitigation Visual-4: Glare Minimization Design Standards***, to reduce light and glare.

Air Quality

Less than Significant Effects

Because Alternative #3A would result in development activity on a similarly sized site, but with substantially fewer units than the Project, Alternative #3A would not result in air quality impacts that would be greater than those analyzed under the Project. As such, all air quality impacts found to be less than significant pursuant to the Project would either be similar to, or reduced as compared to the Project, and not discussed below. These less than significant impacts include:

- Conflict with Air Quality Plan (No Impact)
- Criteria Pollutant Emissions from Construction Activities (Less than Significant)
- Operational Air Quality Emissions (Less than Significant)
- Odors (No Impact)

Only those air quality effects that may remain potentially significant under Alternative #3A are further discussed below.

Construction Period PM_{10} Emissions (Less than Significant with Mitigation)

Alternative #3A would result in air quality impacts related to construction-period fugitive dust (PM_{10}), but these impacts could be reduced with implementation of required mitigation measures. To address construction-period dust and PM_{10} emissions, Alternative #3A would be required to implement ***Mitigation Measure AQ-2A: Basic Dust Control***, and ***Mitigation Measure AQ-2B: Enhanced Dust Control.*** With implementation of MM AQ-2A and -2B, Alternative #3A's construction period generation of PM_{10} would not violate air quality standards or substantially contribute to an air quality violation, and impacts to air quality from fugitive dust emissions would be reduced to levels below significance thresholds.

Construction-Period Toxic Air Contaminant Emissions (Less than Significant with Mitigation)

Construction activity associated with Alternative #3A would be generally similar to that of the Project, using heavy-duty off-road and on-road construction equipment for grading and construction activity throughout the Project site. As presented in the analysis for the Project, these construction activities would produce emissions of toxic air contaminants that would exceed the off-site community risk and hazards threshold of significance, conservatively based on unmitigated emissions. To address these construction-period emissions, Alternative #3A would similarly be required to implement ***Mitigation Measure AQ-4: Construction-Period DPM Emission Reductions.*** As indicated in the Air Quality chapter of this EIR, implementation of the control measures identified in MM AQ-4 would reduce health risk impacts related to construction activities to levels that would be less than significant.

Biological Resources

Less than Significant Effects

Because Alternative #3A would result in development activity on relatively the same portions of the site as would the Project, Alternative #3A would not result in any impacts to biological resources that would be greater than those analyzed under the Project. As such, biological resource impacts found to be less than significant pursuant to the Project would be similarly less than significant under Alternative #3A, including:

- No substantial adverse effect on candidate, sensitive or special-status plant species; and
- No impact related to conflicts with a Habitat Conservation Plan or Natural Community Conservation Plan, as no such plans apply to the Alternative #3A site.

Only those effects to biological resources that may remain potentially significant under Alternative #3A are further discussed below.

Impacts Related to Terraced Grading of the Petaluma River

As indicated in the description of Alternative #3A, this alternative would include property located within the Petaluma River Corridor, and thus would be required to implement riverbank terracing and river habitat management efforts. Therefore, Alternative #3A would result in the same significant impacts associated with the Project's proposed/required riverbank terracing project, and would be required to implement the same mitigation measures and Habitat Management and Monitoring Program, as briefly summarized below:

- *Special Status Bird Species*: Alternative #3A would result in a similar number of trees being removed from the oak and riparian woodlands as would occur under the Project, potentially resulting in substantial adverse effects on candidate, sensitive or special-status bird species.
- *Special Status Reptile, Amphibian and Fish Species:* Alternative #3A could result in adverse effects on candidate, sensitive or special-status reptile, and amphibian and fish species, potentially including removal of habitat for California red-legged frog and Western pond turtle, and degradation of special status fisheries habitat, both directly and through habitat modification.
- *Seasonal Wetlands:* Like the Project, the design for Alternative #3A would require the avoidance and preservation of the approximately 0.28 acre seasonal wetlands located along the upper banks of the Petaluma River immediately north of the existing Oak Creek Apartments.
- *Riparian Habitat*: Alternative #3A's terraced grading plan for the banks of the Petaluma River would result in substantial adverse effects on riparian habitat, including removal of approximately 1.62 acres of riparian habitat during grading, but avoiding approximately 0.30 acres of higher quality native riparian vegetation along the River, where practical and without severely diminishing the hydraulic flood flow capacity of the terracing project. Similar to the Project, this area would be restored, for a total of approximately 2.8 acres of replanted riparian habitat.
- *Waters of the U.S:* Alternative #3A could result in potential adverse effects on aquatic habitat within the Petaluma River resulting from hydrological interruption, alteration of bed and bank, increased sedimentation, and other temporary construction-related activities. This impact would be temporary during the grading process

To address the potential biological resource impacts that could potentially occur as a result of grading and construction to create the river terrace project, Alternative #3A would be required to obtain all required authorizations from the U.S. Army Corps, the RWQCB, the California Department of Fish and Wildlife, and other regulatory agencies with jurisdiction (as applicable) for the disturbance of waters, sensitive species, riparian habitat and associated aquatic habitat; to implement a Habitat Mitigation and Monitoring Program (HMMP) providing for new perennial and seasonal wetland habitat within the Project area as mitigation for impacted wetlands and to augment habitat value and increase habitat complexity along the River; and to implement all mitigation measures addressing these potential effects as indicated for the Project, including:

- ***Mitigation Measure Bio-2: Pre-Construction Nesting Surveys***

- ***Mitigation Measure Bio-3A: Limitations on the Grading Period, Mitigation Measure Bio-3B: Pre-Construction Surveys, Mitigation Measure Bio-3C: Relocation, and Mitigation Measure Bio-3D: Implement Best Management Practices***
- ***Mitigation Measure Bio-5A: Riparian Preservation Zone, and Mitigation Measure Bio-5B: Habitat Mitigation and Monitoring Plan***
- ***Mitigation Measure Bio-6: Terraced Grading Erosion Control/Stormwater Pollution Prevention Plan***

Implementation of the HMMP and additional mitigation measures would prevent harm to special status bird species and to more common types of birds protected pursuant to the Migratory Bird Treaty Act; reduce potential impacts of terraced river grading on special status species and sensitive habitats; replace and create new seasonal and perennial wetlands while further enhancing the existing wetlands habitats to be preserved; ensure preservation of the maximum extent of riparian habitat, and providing for restoration of in-kind and on-site habitat of comparable habitat value; minimize potential adverse effects to aquatic habitat within the Petaluma River.

Seasonal Wetlands (Less than Significant with Mitigation)

Development of Alternative #3A within the uplands portion of the site could result in direct removal and fill of approximately 0.34 acres of seasonal wetlands located on the westerly portion of the Project site, near the SMART rail line. These upland wetlands are comprised of depressions created when soil was excavated from these areas and used for prior construction of the adjacent Oak Creek Apartments project. Alternative #3A would be required to obtain all required authorizations from the US Army Corps and RWQCB (as applicable) for the loss or disturbance of on-site seasonal wetlands, and to implement **Mitigation Measure Bio-4: Compensation for Seasonal Wetlands Fill**. With implementation of the identified mitigation measure, the City will ensure that wetland mitigation fully compensates for the loss of wetland acreage and wetland habitat values resulting from this Alternative, such that there is no net loss of wetland acreage and values.

Native Resident or Migratory Wildlife Corridor (Less than Significant with Mitigation)

The increased presence of people and outdoor lighting associated with new development pursuant to Alternative #3A could interfere substantially with the movement of native resident or migratory wildlife species, or with established native resident or migratory wildlife corridors along the Petaluma River. Mitigation Measures recommended to reduce and avoid interference with wildlife movement within the Petaluma River corridor that would be required of Alternative #3A include ***Mitigation Measure Bio-7A: Hooding or Shielding of Outdoor Lighting Fixtures, Mitigation Measure Bio-7B: Pre-Construction Surveys, and Mitigation Measure Bio-7C: Avoidance and Minimization***. Assuming that all other necessary permits and approvals are obtained and mitigation measures implemented, potential impacts on aquatic and riparian wildlife corridors would be reduced to a level of less than significant.

Invasive Species (Less than Significant with Mitigation)

New landscaping associated with development under Alternative #3A could introduce invasive, low habitat-value plant species to the riparian corridor, increasing threats to native riparian habitats. Mitigation measures required of Alternative #3A to reduce and avoid the introduction of invasive, non-native plants into on-site and adjacent riparian habitats include those planting and landscape requirements of ***Mitigation Bio-9: Incorporation of Native Plants in Landscaping Plans***. Detailed

landscape plans implementing this mitigation measure will reduce potential impacts due to the introduction of non-native species to less than significant levels.

Local Policies and Regulations: Tree Removal and Tree Protection (Less than Significant with Mitigation Measures)

Although no actual design for Alternative #3A has been prepared, it is likely that development of Alternative #3A's new homes and roadways would result in a similar level of tree removal as proposed under the Project. Consistent with the City of Petaluma's Implementing Zoning Ordinance, Alternative #3A would be required to implement ***Mitigation Measure Bio-11B: Protected Tree Replacements and Mitigation Measure Bio-11C: Tree Protection Plan***. With implementation of these mitigation measures, Alternative #3A would comply with City of Petaluma plans, policies and ordinances regarding protected trees and the impact would be reduced to a level of less than significant.

Spreading Sudden Oak Death (Less than Significant with Mitigation Measures)

Alternative #3A could result in removal of plant materials hosting Sudden Oak Death. Implementation of ***Mitigation Measure Bio-12A: Infected Tree Identification, Mitigation Measure Bio-12B: Tree Removal Precautions and Mitigation Measure Bio-12C: Debris Removal Precautions*** would be required, consistent with regulations addressing the handling and transport of horticultural plant stocks within and between counties, and would reduce the environmental impacts associated the possible spread of sudden oak death to a level of less than significant.

Cultural Resources (Less than Significant with Mitigation)

Like the Project, Alternative #3A has limited potential to affect, directly or indirectly, the significance of a historical resource. None of the buildings and structures that formerly occupied the site retain sufficient integrity to be considered significant. Although investigations of the site did not encounter any significant archeological resources, the Cultural Resource report indicates that areas located along the banks of the Petaluma River are known to have been occupied by the Coast Miwok, and have a heightened potential for archeological and/or tribal resources to be present below grade. Similarly, areas like the Project site, with alluvium soil deposits in close proximity to rivers, have been known to contain vertebrate fossils. It is also possible that ground-disturbing activities associated with site preparation, grading and excavation for Alternative #3A could disturb as-yet unknown human remains, potentially including Native American human remains.

The potential to uncover such as-yet undiscovered cultural resources during grading and site preparation activity under Alternative #3a is similar to the potential for such discoveries under the Project, as Alternative #3A is similarly near the River and covers a similarly sized area. The potential for future discovery remains, and mitigation measures recommended for the Project, including ***Mitigation Measure Cultural-1: Monitoring of Well Abandonment, Mitigation Measure Cultural-2: Discovery of Unknown Archaeological Resources, Mitigation Measure Cultural-3: Discovery of Unknown Paleontological Resources and Mitigation Measure Cultural-4: Discovery of Human Remains*** would also apply to Alternative #3A. Implementation of the mitigation measures is consistent with the provisions of California Health and Safety Code, and would serve to ensure that ground-disturbing activities do not adversely affect as-yet undiscovered cultural resources.

Geology

Less than Significant Effects

Because Alternative #3A would result in development activity on generally the same site as the Project, Alternative #3A would not result in geologic impacts that would be greater than those analyzed under the Project. As such, all impacts related to geologic hazards or conditions found to be less than significant pursuant to the Project would either be similar to, or reduced as compared to the Project. These less than significant impacts include:

- Less than significant effects related to surface fault rupture, as no faults are mapped across the site and the risk of ground rupture within the site boundaries is considered very low;
- Less than significant effects related to liquefaction, based on detailed studies that indicate no potential for liquefaction within the development areas of the site;
- Less than significant effects related to landslides, because those portions of the site developed for new homes pursuant to Alternative #3A are generally flat and present no potential for landslide hazards. Alternative #3A would include terracing along the Petaluma River, but there are no geotechnical hazards related to slope stability for the river terrace and as such, no mitigation measures are required;
- No impact related to reliance on appropriate soil capabilities to support the use of septic tanks, as this Alternative would utilize the municipal sewer system present in the area;
- No impact related to the loss of mineral resources, as there are no known mineral resources on the site and no designated mineral resource sectors within the site or its vicinity.

Only those geologic effects that may remain potentially significant under Alternative #3A are further discussed below.

Exposure to Strong Seismic Ground Shaking (Less than Significant with Mitigation)

Alternative #3A could expose people or structures to potentially substantial adverse effects involving strong seismic ground shaking. Similar to the surrounding region, there is likely to be at least strong seismically induced ground shaking at the Alternative #3A site from an earthquake on the Roger's Creek-Healdsburg, Hayward or San Andreas Faults. Pursuant to existing regulatory requirements, the following mitigation measures would be required of Alternative #3A: ***Mitigation Measure Geo-2A: Compliance with California Building Code*** and ***Mitigation Measure Geo-2B: Incorporation of Geotechnical Investigation Recommendations***. Incorporation of seismic construction standards as required by these regulatory requirements would reduce the potential for catastrophic effects of ground shaking, but would reduce the hazards to a level considered acceptable by the state of California for reducing seismic risks to acceptable levels, and therefore to a level of less than significant.

Expansive Soils (Less than Significant with Mitigation)

Portions of the Alternative #3A development site may contain localized expansive soil, creating substantial risks to property. The impacts of expansive soils can be mitigated by grading and/or foundation measures that may be applicable to portions or all of the Alternative #3A site, including ***Mitigation Measure Geo-5A: Soil Treatment*** and ***Mitigation Measure Geo-5B: Foundation Design***. Implementation of the above mitigation measures will reduce the potential impact of expansive soils to less than significant levels.

Soil Erosion (Less than Significant with Mitigation)

Grading activities for Alternative #3A will involve disturbing and removing topsoil, and substantial grading activities will be necessary to implement the River terracing plan. During this earthwork activity, topsoil could be mobilized by storm waters and wind, and increase sediment loads in waterways. The finished River terrace slopes will be especially susceptible to erosion from surface runoff and River flows, and will need to be protected in order to reduce these impacts. To address potential erosion impacts associated with Alternative #3A, ***Mitigation Measure Geo-6: Erosion Control Plan*** would be required, in accordance with the City of Petaluma's Subdivision Ordinance and the City's Grading and Erosion Control Ordinance. Implementation of these measures would reduce the potential impact of soil erosion to a level of less than significant.

Hazards

Less than Significant Effects

Because Alternative #3A would result in development activity on generally the same site but with single-family homes rather than apartments, Alternative #3A would not result in hazards or hazardous materials impacts that would be greater than those analyzed under the Project. As such, all impacts related to hazards or hazardous materials found to be less than significant pursuant to the Project would either be similar to, or reduced under Alternative #3A as compared to the Project. These less than significant impacts include:

- Compliance with applicable regulations will ensure that construction and operation of the Project will not create a significant hazard to the public or the environment through the routine transport, use, or disposal of potentially hazardous materials.
- Required compliance with all federal state and local regulations regarding use, handling and storage of hazardous materials will minimize the risk of accidental upset or spill.
- Regulatory measures that prevent spills and provide that corrective actions be taken in the event of a spill also ensure that construction related hazardous materials do not pose a threat to schools located within ¼ mile.

Registered Hazardous Materials Sites (Less than Significant with Mitigation)

No portion of the Project site, including the Alternative #3 site, is included on a list of hazardous materials sites, including the DTSC's EnviroStor database and the SWRCB's GeoTracker database. However, a Phase I ESA report recommends that the surface soil at the site be tested for pesticides prior to development because of the former agriculture use. Implementation of ***Mitigation Measure Haz-1: Soil Testing and Regulatory Compliance***, would address the potential for residual pesticides, and the impacts regarding hazardous materials exposure will be reduced to a level of less than significant.

Hazardous Conditions - Increased Presence along Rail Tracks (Less than Significant with Mitigation Measures)

Like the Project, Alternative #3A's westerly boundary is parallel and immediately adjacent to the SMART railroad right-of-way. The increased presence of residents and visitors in an area immediately adjacent to the rail tracks would result in a greater potential for rail-related accidents along this portion of the line. Alternative #3A would require implementation of ***Mitigation Measure Haz-5: Fencing*** to include appropriate fencing along the edge of and parallel to the rail tracks. Construction of appropriate fencing

along the Project's frontage to the rail tracks would reduce safety hazards associated with access onto the railroad right-of-way to a level of less than significant.

Hazardous Conditions – Rail Crossing (No Impact)

Unlike the proposed Project, Alternative #3A does not include a new at-grade crossing of the SMART railroad right-of-way. Without such a crossing, this Alternative would not increase the potential for traffic, bicycle or pedestrian train collisions and train-related accidents.

Emergency Access (No Impact)

Alternative #3A's primary access would be from Graylawn Avenue. Petaluma Fire Code would require this Alternative to provide two separate and approved fire apparatus access roads. Therefore, Alternative #3A would include a secondary means of access via a public access easement at the existing frontage at the end of Bernice Court. As proposed under the Project, the Bernice Court connection would be an emergency vehicle access (EVA) only, and not a through street, and would be designed to meet all fire apparatus, turning radius and turnaround requirements of the Petaluma Fire Code. The Petaluma Fire Department has reviewed this proposed EVA route and found it to provide acceptable emergency access to the site.

Hydrology

Because Alternative #3A would result in development activity on generally the same site but with fewer, less densely developed units that the Project, Alternative #3A would not result in hydrology or water quality impacts that would be greater than those analyzed under the Project. As such, all impacts related to hydrology and water quality found to be less than significant pursuant to the Project would either be similar to, or reduced as compared to the Project. These less than significant impacts include:

- Alternative #3A would not place any new housing or create any new habitable space on the first floor of a new building that is located with a regulated floodplain (i.e., within a 100-year flood hazard area as defined on applicable FEMA Flood Insurance Rate Maps).
- Alternative #3A would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site, nor would it create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems. Similar to the Project, Alternative #3A would likely include a storm drain plan similar to the Project that would not connect to the City's storm drainage system, but would have an ultimate outfall (port on-site treatment) into the Petaluma River.
- Alternative #3A would not draw upon or otherwise reduce groundwater resources.
- The Alternative #3A site is not located in an area that would expose persons to inundation by seiche, tsunami, or mudflow, and is a site that is nearly level and not in proximity to any large lake or the ocean.

Only those hydrology and water quality impacts that may remain potentially significant under Alternative #3A, or that are substantially different than the conclusions indicated for the Project, are further discussed below.

Increased Pollution, Erosion and Siltation during Construction

Construction activity associated with Alternative #3A would cause a temporary increase in the potential for soil loss and erosion, and an increase in sediment and polluted runoff delivered to the Petaluma

River resulting from soil disturbance and grading. The operation of large construction equipment could also result in the contribution of petroleum hydrocarbons and heavy metals in construction-period stormwater runoff. Like the Project, Alternative #3A would include river terracing and associated grading within the river banks, and so could expose newly graded and exposed floodplain terraces with the potential to contribute fine sediment and silt directly to the river. To address construction-period erosion and siltation, as well as the introduction of construction-related sources of water pollution, Alternative #3A would similarly be required to demonstrate compliance with all applicable regulatory requirements, including:

- Filing a Notice of Intent (NOI) with the RWQCB for compliance with the NPDES General Construction Activities Permit;
- Preparation of a site-specific Storm Water Pollution Prevention Plan (SWPPP) per NPDES general construction permit requirements, including all BMPs as identified in ***Mitigation Measure Hydro-1: SWPPP Requirements***; and
- Preparation of an Erosion Control Plan to be reviewed and approved by the City of Petaluma prior to issuance of a grading permit;

With proper design and implementation, compliance with regulatory requirements and mitigation measures would reduce Alternative #3A's effects on the quality of storm water runoff from construction to less-than-significant levels.

Operational Water Quality

The long-term operation of Alternative #3A would contribute to the levels of non-point sources of pollutants and litter entering downstream waters, including the Petaluma River and the San Francisco Bay. An increase in non-point sources of pollutants could have adverse effects on wildlife, vegetation, and human health. Similar to the Project and other development within the City, Alternative #3A would be required to comply with the NPDES General Permit for the Discharge of Storm Water from Small MS4s, including the incorporation of site design measures, source controls, stormwater treatment measures, and/or other low impact development measures to reduce stormwater runoff and limit the transport of pollutants to receiving waters. Alternative #3A would be required to prepare a Storm Water Control Plan (SWCP) that shows how site drainage would be treated either through bio-filters located in open areas, or through self-treating areas. Additionally, Alternative #3A would be required to implement ***Mitigation Measure Hydro-2A and -2B***, demonstrating design, construction and implementation (including monitoring and maintenance) of appropriate post-construction stormwater treatment measures to reduce water quality and hydromodification impacts to downstream reaches, as required by the current post-construction controls requirements of the Small MS4 General Permit. These regulatory requirements and mitigation measures would reduce effects on the quality of storm water runoff from Alternative #3A during operation to less-than-significant levels.

River Terracing

As described in the description of this alternative, Alternative #3A would implement the same riverbank terraced grading as proposed under the Project. The terraced grading plan for Alternative #3A would result in a net removal of approximately 21,140 cubic yards of soil from along the riverbanks, thereby expanding the channel capacity and lowering the base flood elevation. With terraced grading on the boundaries of the base floodplain, the 100-year floodplain boundary within the Project site would be marginally reduced; the 100-year floodplain boundary at reaches of the river immediately upstream of the terraced grading would also be marginally reduced as compared to the current floodplain; and slight

increases in projected water surface elevations at downstream reaches of the River would result in virtually no addition to the current floodplain boundaries. Like the Project, terraced grading along the river under Alternative #3A would result in negligible changes to the floodplain boundary and the impact would be less than significant.

Land Use

Dividing and Established Community

Alternative #3A does not include any physical components that would substantially reduce mobility or access to or through the surrounding community. This alternative would involve construction of new single-family homes on a vacant site located on the periphery of an area that has previously been developed for residential use.

Conflict with Plans and Policies

The residential density pursuant to Alternative #3A would be 79 units distributed across 15.45 gross acres, or a density of 5.1 units per gross acre. This density is generally consistent with that of the single-family residential neighborhood to the south, and would be consistent with the General Plan goal of developing underutilized infill sites at densities that are equal to that of surrounding land uses, but would not achieve the goal of developing at densities that are higher than surrounding land uses.

Like the Project, the Alternative #3A site is currently zoned both PUD (on the larger APN-009 parcel) and R4 (on the smaller APN-006 parcel). The R4 zone is intended for a variety of housing types ranging from single dwellings to multi-unit structures, at densities ranging from 8.1 to 18.0 units per acre. Alternative #3A would only achieve a density of approximately 5.1 units per gross acre on the combined parcels, which may be lower than (but would not exceed) the Medium Density Residential General Plan designation of 8.1-18 units to the net acre. However, General Plan Policy 1-P-4 (third bullet) states that an exception to the minimum density may be considered in the case where minimum development yield is constrained by a pre-existing PUD, which is the case for the project site. Alternatively, Alternative #3A could be designed to retain certain portions of the site containing more environmentally sensitive resources as open space, such that the development density attains 8.1 dwelling units per net acre). The larger APN -009 parcel is subject to the 1982 Oak Creek Apartments Conditions of Approval, which limit future land uses on the parcel to only those uses permitted in the Agricultural District. Development of Alternative #3A would require a re-zoning of APN-006 and -009 to the new PUD, redistributed residential units from parcel -006 to parcel -009 (as well as clarifying revisions to the Oak Creek Apartment PUD), or rezoning to an appropriate conventional residential zoning district.

Portions of the Alternative #3A site within APN-009 are designated as Flood Plain Combining District and Floodway Zone, based on current FEMA mapping. As further specified in the Land Use chapter of this EIR, additional portions of the -009 site are included within the designated Petaluma River Plan Corridor, which is comprised of the Preservation, Restoration, and Buffer management zones of the River Plan. The only development activities allowed with the Corridor include trails, terracing and restoration. This alternative would be capable of achieving the City's "zero-net fill" policy, and could be developed without placing any new structures within the designated Preservation, Restoration, and Buffer management zones of the River Plan.

Conflict with a Conservation Zone

There are no formal habitat conservation plans or natural community conservation plans that have been adopted within the City of Petaluma, but the conservation goals set forth in the City's Petaluma River

Access and Enhancement Plan would apply to Alternative #3A. This Alternative would be required to be designed such that no residential component of this Alternative would extend into the Petaluma River Plan Corridor (including the Preservation, Restoration and Buffer management zones of the River Plan), and would be required to implement mitigation measures such as those recommended for the Project to ensure consistency with the objectives, policies and programs of the Petaluma River Access and Enhancement Plan. Implementation of these mitigation measures would reduce potential conflicts with the Petaluma River Access and Enhancement Plan to a level of less than significant.

Noise

Because Alternative #3A would result in development activity on generally the same site but with substantially fewer units that the Project, Alternative #3A would not result in new noise impacts that would be greater than those analyzed under the Project. As such, all impacts related to new noise sources found to be less than significant pursuant to the Project would either be similar to, or reduced as compared to the Project. These less than significant impacts include:

- Noise due to the use and occupation of the site by new residences would not significantly increase or alter the existing noise environment.
- Traffic generated by this Alternative would not result in a substantial, permanent increase in ambient noise levels in the vicinity, such that traffic noise would exceed "normally acceptable" noise levels at nearby land uses.

Only those noise impacts that may remain potentially significant under Alternative #3A, or that are substantially different than the conclusions indicated for the Project, are further discussed below.

Land Use Compatibility

Like the Project, Alternative #3A would expose new residents to ambient noise levels of between 60 to 65 dBA Ldn (which is considered to be "conditionally acceptable" for multi-family residential uses), and to reasonably foreseeable future train noise levels in excess of the 65 dBA Ldn threshold within approximately 54 feet of the rail tracks. Existing and future noise levels at the Alternative #3A site will be considered "conditionally acceptable" for single-family residential uses. Consistent with ***Mitigation Measure Noise-1A: Achieve "Conditionally Acceptable" Noise Levels*** and ***Noise-1B: Noise Insulation***, the design of Alternative #3A would need to place new homes no closer than 54 feet from the railroad tracks, and the design of new residential units would need to provide specific noise insulation to achieve interior noise levels of 45 dBA or lower. These measures would be capable of reducing anticipated noise conditions inside buildings to a level of less than significant.

Train Vibration

Like the Project, Alternative #3A would expose new residents to reasonably foreseeable vibration levels in excess of the threshold established by the FTA and FRA for residential uses. Alternative #3A could accommodate ***Mitigation Measure Noise-2: Avoidance/Vibration Attenuation Measures*** that ensure residential buildings be constructed no closer than 100 feet from the railroad tracks or providing for structural design measures for residential buildings closer than 100 feet from the tracks, as necessary to reduce groundborne vibration to below threshold levels.

Train Horn Noise

Alternative #3A would expose new residents to reasonably foreseeable future noise from train horns. Much of any Alternative #3A site would be exposed to "severe impact zone" (in excess of 60 dB Ldn) of

train warning-horn noise from the Payran crossing. Noise from the train-warning horn at the Payran crossing is not attributable to development of this Alternative, but would affect the site and its new residents. Noise from the train-warning horn exceeds the 60 dB Ldn threshold and the City of Petaluma's noise impact criteria, and this noise level is considered a significant. In an effort to reduce the frequency of the sounding of train horns, the City has established "Quiet Zone Standards" with SMART at all existing crossing within Petaluma (including at Payran). Thus, the sounding of train horns is not required, but permitted at the SMART train operator's discretion for railroad or safety reasons. Still, the Quiet Zone designation does not apply to freight trains and train horns will continue to be sounded with the crossing of some SMART trains. ***Mitigation Measure Noise-1B (Noise Insulation***) would apply to this Alternative, requiring specific noise control treatments to achieve interior noise levels of 45 dBA or lower e.g., sound rated windows and doors, sound-rated wall construction, acoustical caulking, protected ventilation openings, stucco siding, thicker walls, bedroom orientation, etc.). Implementation of this measure would reduce noise impacts from existing train horns to a less than significant level.

Unlike the Project, Alternative #3A would not expose existing and new residents to the additional train horn noise from trains crossing the proposed Shasta Avenue Extension crossing. Alternative #3A would not be required to seek a "Quiet Zone" designation for the Shasta Avenue crossings pursuant to Mitigation Measure Noise-3.

Traffic Noise

Based on noise calculations prepared in 2008 and augmented with noise measurements from the 2012 Rainier EIR, the current traffic load on Graylawn Avenue (which is measured at 954 ADT, based on the traffic analysis presented in Chapter 14 of this DEIR) generates an average CNEL of 52.8 dBA at 50 feet from the roadway centerline. Under Alternative #3A, all traffic generated by this alternative (estimated at 756 daily trips) would utilize Graylawn, as no Shasta Extension would be provided. This additional traffic would not double existing traffic volumes, would not cause an increase of up to 4 dBA in traffic noise along Graylawn, and the resulting noise level would not exceed the threshold of 60 dBA for "normally acceptable" noise environments for single-family residences.

Construction Noise Impacts

Construction of Alternative #3A would result in temporary but periodically significant construction noise impacts. The Alternative #3A site is close to the existing Oak Creek Apartments, as well as neighbors along Bernice Court, Graylawn Avenue and Jesse Avenue. Construction of this Alternative could expose these neighbors to construction noise that may occur for a year or more in duration. With required conformance with the City of Petaluma Noise Ordinance and implementation of construction-period noise mitigation measures (***Mitigation Measures Noise-4A: Construction Hours, -4B: Construction Engine Controls, -4C: Stationary Equipment and Staging, -4D: Miscellaneous Construction Noise, -4E: Noise Barriers, and -4F: Noise Disturbance Coordinator***), the majority of construction-period noise impacts would be reduced to a level of less than significant. However, because the period of construction activity would likely occur for a period of more than 1 year, and because certain construction activities resulting in noise levels exceeding 90 dBA Leq may occur quite close to the nearest existing sensitive receptor and may not be able to be effectively attenuated to acceptable levels (i.e., 80 dBA) with use of available noise reduction strategies, construction noise effects on these most nearby neighbors is conservatively considered to be ***significant and unavoidable.***

Traffic and Transportation

As indicated in the description of Alternative #3A, this alternative would transfer densities from the APN-006 site (Webb parcel) to the remainder of the Project site through a new PUD, distributing a maximum development potential of 79 single-family residential units across the full Project site. Primary access for Alternative #3A would be via the existing Graylawn Avenue, would not include a Shasta Avenue extension across the rail tracks, but would be dependent upon an EVA connection to Bernice Court.

Using single-family residential trip generation rates derived from the Davidon Homes EIR,[1] a 79-unit single family residential development could be expected to generate a total of approximately 756 daily vehicle trips (at 9.57 daily trips per unit), 61 AM peak hour trips (at 0.77 AM peak hour trips per unit), and 81 PM peak hour trips (at 1.02 PM peak hour trips per unit). The maximum projected new trips for Alternative #3A represent approximately 44% of the daily trips, 46% of the AM peak hour trips, and nearly 50% of the PM peak hour trips as calculated to be generated by the Project.

Less than Significant Effects

Because Alternative #3A would result in approximately 45% to 50% of the vehicle trips as compared to the Project, Alternative #3A would not result in any traffic or transportation impacts that would be greater than those analyzed under the Project. As such, traffic and transportation impacts found to be less than significant pursuant to the Project would either be similar to, substantially reduced, or avoided as compared to the Project. These less than significant impacts include:

- The addition of traffic generated under Alternative #3A to existing traffic conditions would not cause a level of service standard established by the City of Petaluma to be exceeded at any study area intersections.
- The addition of traffic generated under Alternative #3A to "Pipeline" traffic conditions would not make a significant contribution of traffic under the Pipeline scenario, and the Project's impacts would be less than significant.
- Traffic generated by Alternative #3A would not cause a freeway segment operating at LOS E or better to deteriorate to LOS F, and would not cause an increase in traffic on a freeway segment already exceeding LOS E by more than one percent of the freeway segment's design capacity, under Existing, Pipeline or cumulative conditions.
- Alternative #3A would not result in a significant unanticipated increase in transit patronage beyond the system's current capacity, but potentially could result in development that is not appropriately accessible to transit riders (defined as within one-quarter mile of a transit stop).
- The design of Alternative #3A's on-site circulation is presumed to be capable of adequately accommodating emergency vehicles accessing and circulating within the site.

Only those traffic and transportation effects of Alternative #3A that may remain potentially significant, or that are substantially different than the Project, are further discussed below.

[1] City of Petaluma, *Davidon Homes Tentative Subdivision Map and Rezoning Project Draft Environmental Impact Report*, February 2013, Table 4.12.12

Cumulative Plus Project Intersection Level of Service

Pursuant to the Petaluma General Plan's Goal 5.3, a grid of streets will be developed near Petaluma Boulevard North, adjacent to the Rainier Avenue extension. A key element of this planned grid street system includes a Shasta Extension to Rainier, that would arc northward on the west side of the SMART rail tracks to a new intersection connection at Rainier Avenue. Under a Cumulative scenario (without Alternative #3A), buildout of the General Plan would cause the Petaluma Boulevard North/Shasta Avenue intersection (which currently operates at LOS A during both AM and PM peak periods), to operate at LOS F in the PM peak hour. Because Alternative #3A would add at least one vehicle trip to this intersection (even without the Shasta Avenue Extension to Graylawn and its at-grade crossing) it would contribute to this cumulative impact. Alternative #3A would be required to pay applicable Traffic Impact Fees to be applied to necessary improvements at this intersection, pursuant to ***Mitigation Measure Transp-3: Petaluma Boulevard/Shasta Avenue***. Transportation impact fees are determined based on a project's fair share of the aggregate costs of roadway improvements. Transportation impact fees are routinely updated to reflect project timing and costs. Fair-share costs attributable to Alternative #3A are expected to be approximately 1 to 2%

Emergency Vehicle Access

Alternative #3A would not substantially increase roadway hazards, as it would not include the Project's proposed Shasta Extension to Graylawn from west of the SMART rail tracks that includes an at-grade crossing. Emergency vehicles would be able to approach the Project site using both Graylawn Avenue and a secondary emergency vehicle access (EVA) via a connection to the end of Bernice Court. Improvement of the Bernice Court frontage would need to provide an acceptable fire apparatus roadway meeting all turning radius and turnaround requirements of the Petaluma Fire Code to meet emergency access requirements. This impact would be less than significant.

Local Roadway Capacity

Alternative #3A would not cause an increase in traffic volumes on Graylawn Avenue that would exceed the capacity and street design standards established by the City of Petaluma. According to the Petaluma General Plan 2025 Mobility Report, Graylawn Avenue is identified as a local residential road. Pursuant to the Street Standards for the City of Petaluma, local residential roadways are intended to carry up to a maximum average of up to 2,000 daily traffic trips (ADT). Based on roadway counts collected in November 2015, Graylawn Avenue currently carries 954 vehicles per day. Adding all of vehicle trips generated under Alternative #3A (approximately 756 daily vehicle trips) to Graylawn Avenue would result in 1,710 vehicles using Graylawn Avenue on an average day. Based on this assessment, the additional vehicle trips attributed to Alternative #3A would be accommodated within the 2,000 vehicles per day design standard for a local residential road, and this Alternative would not cause this standard on Graylawn Avenue to be exceeded.

This alternative would not result in construction of the Shasta Avenue Extension to Graylawn, and thus would not contribute vehicle trips to Shasta Avenue on the west side of the rail tracks.

Pedestrian and Bicycle Circulation

Based on the General Plan 2025 Mobility Report's goals and policies, walking distance greater than one-quarter mile (approximately a five to 10-minute walk) from a residential neighborhood to a retail center or transit are undesirable. Because Alternative #3A does not include a rail crossing at the Shasta Extension to Graylawn, walking distance from the Project site to retail and transit services would be approximately one-half mile or more along Graylawn to Payran, and would require pedestrians to cross

the rail tracks at Payran Street. ***Mitigation Measure Transp-9C: At-Grade Rail Crossing Safety Measures at Payran Avenue*** would be required to provide the residents of Alternative #3A with safe and effective pedestrian and bicycle access to retail and transit facilities.

Construction Traffic

The duration of the construction period associated with Alternative #3A would likely be similar as that assumed for the Project, and would cause temporary disruption to the transportation network. ***Mitigation Measure Transp-13: Prepare Construction Management Plan*** would be required to address temporary construction impacts surrounding the site.

Utilities

Less than Significant Effects

Because Alternative #3A would result in development activity on a similarly sized site but with substantially fewer units than the Project, Alternative #3A would not result in any demands on public utilities and services that are greater than those analyzed under the Project. As such, all impacts related to utilities, which were found to be less than significant pursuant to the Project, would be reduced under Alternative #3A as compared to the Project. These less than significant impacts include:

- There are sufficient water supplies available to serve Alternative #3A from existing entitlements and resources, and new or expanded entitlements are not needed. Alternative #3A would add to the cumulative demand for overall water supplies, and contribute to projected dry year water shortages. Therefore, this Alternative would be required to include water conservation strategies that reduce overall water demands to levels projected to be sustainable on a cumulative basis, and would be subject to water shortage contingency plans that are now in place, and as may be implemented in the future.
- Wastewater generated by Alternative #3A would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board, would not necessitate construction of new or expanded wastewater treatment facilities, or result in a determination by the wastewater treatment provider that it has inadequate capacity to serve this Alternative's projected wastewater treatment demand in addition to existing commitments.
- Alternative #3A may require construction of new storm water drainage facilities or the expansion of existing facilities. Similar to the Project, the Alternative #3A site would be in close proximity to the Petaluma River, and stormwater runoff from this Alternative would be assumed not to enter the City of Petaluma's storm drainage infrastructure system, but rather would be collected within an on-site storm drainage system and directed to outlets from which the stormwater would enter into the Petaluma River. All such storm drainage infrastructure would be required to comply with all provisions of the Petaluma Stormwater Management and Pollution Control Ordinance, including requirements for the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) and a Stormwater Management Plan (SMP) similar to that of the Project.
- Alternative #3A would be served by a landfill with sufficient permitted capacity to accommodate its solid waste disposal needs.

Other Less than Significant Effects

In July 2007, the City of Petaluma issued a Notice of Preparation of this Draft EIR, which included a full CEQA Checklist identifying those environmental issues associated with the Project that were determined

to be less than significant. Since Project-related impacts pertaining to the following CEQA topics were determined not to be significant for the Project, and because Alternative #3A is on the same site and would result in fewer residential units than the Project, the Initial Study Checklist conclusions regarding the following environmental issues would also be less than significant pursuant to Alternative #3A:

- The site has not been in agricultural use for more than 30 years, and residential development pursuant to Alternative #3A would not convert any Farmland to non-agricultural use. The site is not zoned for agricultural use, and is not under a Williamson Act contract. No portion of the area surrounding the site is in active agricultural or timberland use, and development of this Alternative would not jeopardize the viability of any existing agricultural or timberland operations.
- The site is located within the urban boundaries of the City of Petaluma and does not abut wildlands. There are no wildland areas in the Project site vicinity, and the Project would therefore not result in any exposure of people or structures to risk of loss, injury or death involving wildland fires.
- The site is not located near any private airstrip, and the nearest airport is the Petaluma Municipal Airport located 2 miles to the east. The site is not included within the Airport Land Use Plan including the "conical zone" approach area, and development of the site would not result in a safety hazard for people working or residing in the area.
- At the City's average population density of 2.6 persons per household, this 79-unit alternative could be expected to add approximately 205 new residents to Petaluma's population. This level of population growth is not considered substantial in comparison to Petaluma's estimated population of 61,166 people, according to ABAG's population estimates for the Petaluma Sub-Regional Study Area.
- The only infrastructure improvements to be constructed pursuant to this alternative would be those necessary to enable development of the site, and would not be available to support or induce additional growth or development in the surrounding area.
- There are no existing housing units or residences on the site, and development of this alternative would not displace any existing housing units or people.
- Development of this alternative would increase the service demands of the Petaluma Fire Department and Police Department, but would not require construction of additional fire or police stations, or the expansion of any existing facilities to serve this Alternative.
- Development of this Alternative would increase the number of students attending public schools, but would not require construction of new schools beyond that already anticipated. The developer of this Alternative would be required to pay all applicable school impact fees.
- This Alternative would increase use of parks and recreational facilities, but would not require construction of new parks or recreational facilities beyond those already anticipated.

Alternative #3B: Redistributed Density as Apartments

Description

Another development alternative for the Project site can be envisioned by which the potential residential densities as calculated for Alternative #2 (a total of 79 units on the APN-006 parcel, only) could be less densely distributed throughout the entire Project site, rather than as a higher density project located on APN-006 only. The premise of this alternative is similar to the 1982 Oak Creek Apartment project PUD, which effectively transferred densities from the APN-009 site to the APN-007 site. Under this alternative, a portion of the unit number possible on the APN-006 site would be redistributed to the APN-009 site, likely through a new PUD.

Alternative #3B would involve a re-zoning of parcels APN-006 and -009 to a new PUD zone for townhome or apartment development, shifting units from the -006 parcel to the -009 parcel, as well as clarifying revisions to the Oak Creek Apartment PUD. Rezoning to conventional R4 zoning might also serve to accommodate the described Alternative #3B. A Lot Line Adjustment, Tentative Parcel Map or Tentative Subdivision Map, as well as Site Plan and Architectural Review would also be required. The density of up to 79 units spread over the 15.45 net acres of developable portions of APNs -006 and -009 would yield a density of approximately 5.1 units per gross acre, which is below the 8.1 units per net acre minimum density of the Medium Density Residential land use category. However, a General Plan Amendment does not appear necessary as General Plan Policy 1-P-4 states that an exception to the minimum density may be considered in the case where minimum development yield is constrained by a pre-existing PUD. Should the decision makers prefer, Alternative #3B could include a General Plan Amendment designating certain more sensitive portions of APN-009 to Open Space (to the point where the development area density calculation attains 8.1 dwelling units/net acre).

Development Assumptions for Alternative #3B

Under a scenario whereby both the APN-006 and -009 parcels were used to accommodate a 79-unit apartment complex, and assuming apartment units similar to the adjacent Oak Creek Apartment complex (at approximately 12 units per acre), an apartment complex pursuant to this Alternative would only require approximately 6.6 acres of developable land, or only approximately one-half of the total acreage of both parcels. The remaining portions of the net developable area would be available to accommodate residential amenities such as a swimming pool and clubhouse, to provide greater setbacks from abutting residential uses and from the rail line, as well as to enable greater set-asides for tree preservation, River Corridor buffers and wetland protection. The following environmental analysis of Alternative #3B focuses on the environmental differences between developing a total of 79 units in a more densely compacted apartment/townhome configuration, rather than as a single-family lot scenario were new residential lots would cover an area similar to the Project site.

Site Access

Primary access for Alternative #3B would be via existing Graylawn Avenue. The traffic load on Graylawn Avenue that would result from Alternative #4 would be similar to the traffic load generated by Alternatives #2 and #3A. The number of new trips generated by this alternative would be generally consistent with the intent of the 1982 PUD, which effectively limited development on the APN-009 property but did not materially affect trips generated from the APN-006 property. This Alternative would not include a Shasta Avenue extension across the rail tracks, but would be dependent upon an EVA connection to Bernice Court.

Consistency with the Petaluma River Access and Enhancement Plan

According to the River Plan, no subdivision, use permit, design review or other entitlement for land use shall be authorized for construction in the "designated River Corridor", if that proposed action is not in substantial compliance with the Petaluma River Access and Enhancement Plan." Alternative #3B would re-distribute residential densities from the -006 Parcel to the -009 Parcel, which is within the designated River Corridor. Thus, Alternative #3B would be required to implement the City's Petaluma River Access and Enhancement Plan objectives including expanding the river channel capacity with the terraced grading plan as developed for the Project, as well as the river vegetation management and enhancement requirements as proposed under the Project's Habitat Management and Monitoring Program.

Environmental Analysis of Alternative #3B

Alternative #3B is, in many respects, similar to Alternative #3A. Both of these Alternatives include construction of a total of 79 new residential units (79 single-family homes under Alternative #3A and 79 apartments or townhomes under Alternative #3B). Both of these alternatives would be developed on the same site as the Project, but potentially requiring less developable land than does the Project. As such, the environmental effects associated with Alternative #3B are, in most instances, similar to the effects of Alternative #3A. Both Alternative #3A and Alternative #3B do not include construction of the Project's proposed at-grade crossing of the rail tracks at the Shasta Avenue Extension.

The differences between Alternative #3A and Alternative #3B is that the higher density apartment or townhome development pursuant to Alternative #3B would require less developable land than would the lower density single-family lots assumed under Alternative #3A. The environmental analysis presented below identifies the relative environmental differences between the more compact, higher density development pattern assumed for Alternative #3B, and the less dense single-family lot development patter assumed for Alternative #3A. Unless specifically discussed below, the potential environmental effects, and any required mitigation measures indicated for Alternative #3A, are assumed to be the same or similar pursuant to Alternative #3B.

Aesthetics

Alternative #3B could result in significant aesthetic environmental effects related to scenic vistas, scenic resources or the existing visual character or quality of the site and its surroundings. However, new apartment or townhome development pursuant to Alternative #3B is assumed to be developed only within the upland portions of the Project site, removing open grassland and potentially certain scattered oaks and other trees. Alternative #3B would also include the River terracing flood control project that would re-contour the western bank of the Petaluma River channel. It is presumed that apartments or townhomes could be designed such that no development would encroach into, and that a larger setback could be provided from the Petaluma River Plan Corridor, such that the last remaining vestige of oak woodlands and other riparian trees marking the location of the River would be preserved. Alternative #3B would likely result in removal of certain oaks and other protected trees throughout the site, but at lower numbers than as required under the Project or under Alternative #3A.

Biological Resources

Seasonal Wetlands

Development of a smaller, approximately 6.6-acre portion of the uplands site pursuant to Alternative #3B provides the opportunity to design this Alternative to avoid removal and fill of approximately 0.34

acres of seasonal wetlands located on the westerly side of the site, near the SMART rail lines. With avoidance of this on-site seasonal wetlands, no further mitigation measures would be required to address the loss of wetland acreage or wetland habitat values.

Tree Removal and Tree Protection

Although no design for Alternative #3B has been prepared, it is assumed that development of fewer new apartment or townhome units within the same overall site area as the Project would be capable of achieving a substantially reduced level of tree removal than is expected under the Project, or as assumed under Alternative #3A. Consistent with the City of Petaluma's Implementing Zoning Ordinance, Alternative #3B would be required to implement ***Mitigation Measure Bio-11B: Protected Tree Replacements and Mitigation Measure Bio-11C: Tree Protection Plan*** for any protected trees that may still be required to be removed. With implementation of these mitigation measures, Alternative #3B would comply with City of Petaluma plans, policies and ordinances regarding protected trees and the impact would be reduced to a level of less than significant.

Hazards

Hazardous Conditions - Increased Presence along Rail Tracks

The westerly boundary of the Project site is parallel and immediately adjacent to the SMART railroad right-of-way. Increased presence of residents and visitors in an area immediately adjacent to the rail tracks would result in a greater potential for rail-related accidents along this portion of the line. With the smaller required development envelop of 6.6 acres pursuant to Alternative #3B, this Alternative could accommodate a substantially greater setback from the rail tracks, such that new apartment buildings would not be located immediately adjacent to the tracks. Implementation of ***Mitigation Measure Haz-5: Fencing*** to include appropriate fencing along the edge of and parallel to the rail tracks would still be required of this Alternative, and construction of appropriate fencing along the frontage of the rail tracks would reduce safety hazards associated with access onto the railroad right-of-way to a level of less than significant.

Land Use

Conflict with Plans and Policies

The residential density pursuant to Alternative #3B would be 79 apartment or townhome units distributed across 15.45 gross developable acres, or an overall density of 5.1 units per gross acre. This overall gross density is generally consistent with the General Plan goal of developing underutilized infill sites at densities that are equal to that of surrounding land uses, but would not achieve the goal of developing at densities that are higher than surrounding land uses.

Like the Project, the Alternative #3B site is currently zoned both PUD (on the larger APN-009 parcel) and R4 (on the smaller APN-006 parcel). The R4 zone is intended for a variety of housing types, including multi-unit structures at densities ranging from 8.1 to 18.0 units per acre. At an approximate mid-point of this density range at 12 units per acre, Alternative #3B would only require approximately 6.6 acres of the 15.45-acre developable portion of the site. The remaining approximately 8.8 acres could be re-designated as Open Space to include a substantially larger setback from the River, to enable preservation of upland wetlands near the rail tracks, and to preserve additional protected trees on the site. The larger APN -009 parcel is subject to the 1982 Oak Creek Apartments Conditions of Approval, which limit future land uses on the parcel to only those uses permitted in the Agricultural District. Development of Alternative #3B would require a re-zoning of APN-006 and -009 to the new PUD,

redistributed residential units from APN-006 to APN-009 (as well as clarifying revisions to the Oak Creek Apartment PUD), or rezoning to an appropriate conventional residential zoning district.

Portions of the Alternative #3B site within APN-009 are designated as Flood Plain Combining District and Floodway Zone, based on current FEMA mapping. As further specified in the Land Use chapter of this EIR, additional portions of the APN-009 site are included in the designated Petaluma River Plan Corridor, which is comprised of the Preservation, Restoration, and Buffer management zones of the River Plan. The only development activities allowed with the Corridor include trails, terracing and restoration. Unlike the Project, Alternative #3B could be developed without placing any new structures within the designated Preservation, Restoration, and Buffer management zones of the River Plan, and could provide an even greater setback from the River Plan Corridor than realized under Alternative #3A.

Noise

Land Use Compatibility

Like the Project and Alternative #3A, Alternative #3B would expose new residents to reasonably foreseeable future ambient noise levels considered "conditionally acceptable" for multi-family residential uses. Consistent with ***Mitigation Measure Noise-1A: Achieve "Conditionally Acceptable" Noise Levels*** and ***Noise-1B: Noise Insulation***, the design of Alternative #3B would need to place new homes no closer than 54 feet from the railroad tracks, and the design of new residential units would need to provide specific noise insulation to achieve interior noise levels of 45 dBA or lower. With the smaller required development envelop of 6.6 acres pursuant to Alternative #3B, this Alternative could accommodate a substantially greater setback from the rail tracks, providing greater opportunity for noise attenuation based on distance from the train noise source. The greater distance, plus required measures would be capable of reducing anticipated noise conditions inside buildings to a level of less than significant.

Train Vibration

It is presumed that Alternative #3B could be designed such that no residential buildings would be constructed within 100 feet from the railroad tracks, such that ground-borne train vibration would not be transmitted into the structures.

Traffic and Transportation

Based on ITE trip generation rates, single-family residential land uses generate traffic at higher rates (i.e., at 9.57 daily trips per unit)[2] than does multi-family residential land uses. The ITE "fitted curve" equation used to generate multi-family trip rates indicates that a 79-unit apartment or townhome project would likely generate traffic at a rate of approximately 6.5 daily trips per unit, or approximately 32% less daily trips that a 79-unit single-family residential development. Therefore, the daily trips and peak hour trips generated under Alternative #3B would be less than generated under Alternative #3A, and substantially less (fewer than 50%) than would be generated under the Project.

Because Alternative #3B would result in less vehicle trips than either the Project or Alternative #3A, Alternative #3B would not result in any traffic or transportation impacts that would be greater than

[2] City of Petaluma, *Davidon Homes Tentative Subdivision Map and Rezoning Project Draft Environmental Impact Report*, February 2013, Table 4.12.12

those analyzed under the Project. As such, traffic and transportation impacts found to be less than significant pursuant to the Project would be substantially reduced or avoided, as compared to the Project.

Cumulative Plus Project Intersection Level of Service

Alternative #3B would add at least one vehicle trip to the intersection at Petaluma Boulevard/Shasta Avenue (even without the Shasta Avenue Extension), which is projected to operate an unacceptable LOS under the Cumulative scenario. Alternative #3B would be required to pay applicable Traffic Impact Fees, to be applied toward necessary improvements at this intersection, pursuant to ***Mitigation Measure Transp-3: Petaluma Boulevard/Shasta Avenue***. Transportation impact fees are determined based on a project's fair share of the aggregate costs of roadway improvements. Transportation impact fees are routinely updated to reflect project timing and costs. Fair-share costs attributable to Alternative #3B are expected to be approximately 1%.

Local Roadway Capacity

Alternative #3B would not cause an increase in traffic volumes on Graylawn Avenue that would exceed the capacity and street design standards established by the City of Petaluma. According to the Petaluma General Plan 2025 Mobility Report, Graylawn Avenue is identified as a local residential road. Pursuant to the Street Standards for the City of Petaluma, local residential roadways are intended to carry up to a maximum average of up to 2,000 daily traffic trips (ADT). Based on roadway counts collected in November 2015, Graylawn Avenue currently carries 954 vehicles per day. Adding all of vehicle trips generated under Alternative #3B (approximately 514 daily vehicle trips) to Graylawn Avenue would result in 1,468 vehicles using Graylawn Avenue on an average day. Based on this assessment, the additional vehicle trips attributed to Alternative #3A would be accommodated within the 2,000 vehicles per day design standard for a local residential road, and Alternative #3B would not cause this standard on Graylawn Avenue to be exceeded.

Alternative #4: Reduced Project – with and without Terraced Grading

Description

This alternative is based on the overall development potential of the site that can be accommodated by the design capacity of Graylawn Avenue under the City's "livable streets" standard. As indicated in the transportation chapter of this EIR, the Petaluma General Plan 2025 Mobility Report identifies Graylawn Avenue as a local residential road. Pursuant to the Street Standards for the City of Petaluma, local residential roadways are intended to carry up to a maximum of 2,000 average daily tips (ADTs), serving up to 200 dwellings.[3] Graylawn Avenue currently carries approximately 954 ADTs,[4] and thus has a maximum remaining capacity of 1,046 ADTs before exceeding the design standards.

Using an ITE "fitted curve" trip generation rate, the 1,046 daily trips of remaining capacity on Graylawn Avenue equates to approximately a 149 multi-family residential unit project (at a fitted curve rate of approximately 7 daily tips per unit).

To achieve the total development potential of 149 multi-family residential units, Alternative #4 is dependent upon an amendment to the 1982 PUD provisions that limit the development potential of APN-009 to only those uses permitted in the Agricultural District. Whereas the General Plan provides for a development potential of up to 79 units on the APN-006 parcel, the 149-unit development program of Alternative #4 is dependent upon an increased development potential of 70 units for APN-009 (149 units - 79 units from APN-006) over the 1982 PUD restrictions. The combination of development potential from both of these properties (79 from APN-006 and 70 from APN-009) could then be redistributed across both properties via a new PUD.

Development Assumptions for Alternative #4

Similar to the Project, the development plan for Alternative #4 would be an apartment complex, but at a total development potential of 149 units, rather than the 278 units as proposed under the Project. This represents approximately 54% of the Project's proposed units. Given this alternative's reduced density, Alternative #4 would be comprised of approximately one-half the number of new apartment buildings as proposed under the Project, clustered into a smaller overall development area. With a smaller development area, Alternative #4 could be designed and developed such that it would not include development within 100-feet of the SMART rail tracks, would provide greater setbacks from the Petaluma River, would keep residential development out of the designated Petaluma River Plan Corridor, and could avoid or reduce removal of trees within the site's oak woodlands and upland area and of protected trees and could avoid the fill of some or all isolated wetlands. With a reduced overall density, but similar layout constructed to avoid environmentally sensitive areas, Alternative #4 could retain the Project's proposed community clubhouse and swimming pool.

Primary access to the site pursuant to Alternative #4 would be via existing Graylawn Avenue, only. This Alternative would not include a Shasta Avenue Extension to Graylawn across the rail tracks, but would

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[3] City of Petaluma Department of Engineering, *Street Design and Construction Standards & Specifications*, Street Standards Design and Application Guidelines (page 3), May 1999

[4] Based on 72-hour tube count conducted in November, 2015 and presented in *Graylawn Data Collection Summary and Roadway Capacity Analysis,* Fehr & Peers, April 13, 2016.

be dependent upon an EVA connection to Bernice Court. The addition of trips attributable to Alternative #4, when added to existing traffic on Graylawn, would not cumulatively exceed the 2,000 ADT design standard for this residential road.

Alternative #4 involves a re-zoning of APN-009 from the current PUD (which now permits no residential development) to the R4 zoning. An Amendment of the Oak Creek Apartment PUD would also be required, particularly the removal of Condition 3d which stipulates that, "primary access to future development of APN-009 [shall] be from a new street, and not from Graylawn Avenue." Likely, this alternative would involve a Tentative Parcel Map to create new development area boundaries and merge APN-006 with -009, although a parcel map is not intrinsically necessary (as a lot line adjustment would be sufficient). Site Plan and Architectural Review would also be required under Alternative #4.

Consistency with the Petaluma River Access and Enhancement Plan

Alternative #4 presents two sub-alternatives pertaining to the Petaluma River corridor:

- Sub-Alternative #4A would include a Petaluma River terraced grading plan similar to, or the same as that identified for the Project. This sub-alternative prioritizes improvements to flood water attenuation and flood flow conveyance over the resulting impacts to biological resources along the Riverbanks.
- Sub-Alternative #4B would not include a Petaluma River terraced grading plan, prioritizing protection of biological resources along the River banks over on-site improvements to flood water attenuation and flood flow conveyance. This approach is also dependent upon an alternative strategy for floodwater attenuation, based on upstream detention rather than increased River conveyance capacity.

The purpose of presenting these two sub-Alternative options is to provide a direct comparison of the relative pros and cons associated with River terrace grading versus up-stream flood flow detention. Based on the hydrology and biology analysis of the Project as presented in this EIR, the City may utilize these options to weigh the relative merits of citywide floodwater attenuation and flood flow conveyance associated with terracing and re-contouring the western bank of the Petaluma River, with the resulting impacts to biological resources along the Riverbanks. This alternative does not pre-suppose any such decision by the City, but merely presents the comparative environmental effects that could be anticipated. The option of not including the terraced grading plan along the river would not comply with the specific policies of the General Plan that direct the terracing project at this site, and would not be consistent with the more general policies of the Petaluma River Access and Enhancement Plan, which call for expanded river channel capacity improvements and river vegetation management and enhancement.

Comparative Analysis Specific to Terraced Grading Options

The following analysis compares the relative aesthetic, biological resource and hydrology impacts that could be anticipated under the options of either conducting terraced grading along the River, or not. All other environmental topics are analyzed for Alternative #4, consistent with the comparative analysis presented above for Alternatives #2 and #3.

With terraced grading along the riverbank, sub-Alternative #4A would result in similar impacts to biological resources as those that would occur under the Project. Due to these impacts, this sub-Alternative #4A would be required to implement a Habitat Management and Monitoring Program, as well as biological resource mitigation measures as required of the Project, as summarized below.

Without terraced grading along the riverbank, sub-Alternative #4B would be able to avoid the majority of impacts that would occur to biological resources at the site (such as loss of wetland, oak trees, and riparian scrub habitat). This sub-Alternative #4B would not be required to implement a Habitat Management and Monitoring Program, would not remove invasive species within the riparian corridor, would not create new wetlands, and would not be required to implement many of the biological resource mitigation measures as required of the Project.

Aesthetics

Visual Character

- With Terraced Grading

Grading along the banks of the River for a terraced flood control project, while avoiding the 0.28-acre high quality native riparian willow vegetation, will remove 1.62 acres of other riparian habitat (most of which is considered lower quality, non-native Himalayan blackberry vegetation) and two oak trees adjacent to the River. The terraced grading design along the riverbank preserves high priority riparian vegetation, removes only two oak trees within the River Plan Corridor, and the River Plan Corridor will be replanted by appropriate species as specified by the Project's Habitat Mitigation and Maintenance Plan. Although the visual character of the site will be affected by construction activities associated with terraced grading, the visual character of the site will be restored at completion. Thus, the proposed river terracing will not result in a significant aesthetic impact on the River Plan Corridor.

- Without Terraced Grading

In comparison to a terraced grading approach, no terraced grading would result in less visual change along the River, and would reduce effects on scenic resources and the existing visual character of the site. Without the river terracing flood control project, but with preservation of the Petaluma River Plan Corridor, the existing riparian habitat (much of which is considered lower quality, non-native Himalayan blackberry vegetation), as well as all of the oak trees adjacent to the River, would remain.

Biological Resources

Special Status Bird Species

- With Terraced Grading

Terraced grading along the riverbank would result in removal of 2 of the 27 protected trees within the riparian and oak woodlands habitat along the River and that are within the River Plan Corridor. Removal of these trees could result in adverse effects on candidate, sensitive or special-status bird species, including removal of nesting habitat and nest abandonment. ***Mitigation Measure Bio-2: Pre-Construction Nesting Surveys*** would be required, protecting identified nests to prevent direct harm to special status bird species, and would mitigate impacts to special status bird species to a level of less than significant. Additionally, the short-term impacts to nesting habitat resulting from removal of riparian vegetation will be mitigated in the longer-term with replanting of appropriate vegetation species as specified by the Project's Habitat Mitigation and Maintenance Plan.

- Without Terraced Grading

Trees along the Petaluma River that provide suitable nesting habitat for special status birds, particularly those trees within the oak and riparian woodlands that exist along the riverbanks, would be preserved pursuant to implementation of Mitigation Measure Bio-10A and 11A. Pre-construction nesting surveys

required of this sub-alternative would be limited to those trees to be removed from the uplands portion of the site, only.

Special Status Reptile, Amphibian and Fish Species

- With Terraced Grading

Grading of the floodway terrace adjacent to the River, and trimming and clearing of vegetation along the bank, could result in the removal of habitat for California red-legged frog and Western pond turtle,[5] and degradation of special status fisheries habitat. In addition to all mitigation measures intended to avoid and minimize impacts to these species as required by the resource agencies, this sub-alternative would also be required to implement ***Mitigation Measures Bio-3A: Limitations on the Grading Period, Bio-3B: Pre-Construction Surveys, Bio-3C: Relocation*** (of any found special-status species), ***and Bio-3D: Implement Best Management Practices.***

- Without Terraced Grading

Special status species habitat is unlikely to occur on the uplands portion of the site outside of the riverbanks. Without terraced grading, no impacts to special status reptile, amphibian or fish species would be expected to occur.

Seasonal Wetlands

- With Terraced Grading

Similar to the Project, the design of terraced grading would be required to avoid and preserve the primary seasonal wetland (approximately 0.28 acres in size) located along the upper banks of the river immediately north of the Oak Creek Apartments. This seasonal wetland represents 45% of the total seasonal wetlands on the site. Excavation to create the flood terrace would eliminate a 0.01-acre wetland, to be replaced by creation of 0.54 acres of new seasonal wetland. A HMMP would also be required, including creation of new perennial and seasonal wetland habitat, as mitigation for other impacted wetlands in the uplands area and that augments habitat value and increases habitat complexity along the River. In addition to all required authorizations from the US Army Corps and RWQCB, the terraced river grading would require implementation of ***Mitigation Measure Bio-4: Compensation for Seasonal Wetlands Fill*** to provide on-site compensatory mitigation sufficient to achieve a no-net-loss standard set by the City.

- Without Terraced Grading:

In addition to retention of the 0.28-acre primary wetland along the River, the 0.01-acre wetland near the River would also be retained. Only those seasonal wetlands that are present in the uplands area (covering 0.33 acres) would be removed under this sub-alternative. These upland wetlands rate as low in function and value, do not contribute substantially to flood flow attenuation, and are relatively isolated from the River. Although each of these upland seasonal wetlands are generally of low quality and provide limited habitat for wildlife, their loss would be considered a significant impact, and on-site

[5] Although CRLF are not expected to occur in the Project site on any regular basis, or for any extended time due to the lack of suitable habitat on-site and marginal dispersal habitat, the possibility cannot be ruled out that CRLF may move through the Project area. Likewise, while no suitable aquatic habitat exists within the Project site for western pond turtles, the possibility cannot be ruled out that turtles may occasionally nest near the Project boundary and could be disrupted by terrace grading operations.

mitigation (i.e., ***Mitigation Measure Bio-4: Compensation for Seasonal Wetlands Fill***) would be required.

Riparian Habitat

- With Terraced Grading

Terraced grading on the banks of the Petaluma River would result in substantial adverse effects on approximately 1.6 acres of riparian habitat, most of which is lower quality, non-native vegetation (largely blackberry). Like the proposed Project, careful design and contouring of terraced grading could avoid approximately 0.3 acres of higher quality native riparian vegetation, but terraced grading would still result in substantial adverse effects on riparian habitat. Similar to the Project's proposed design, this sub-alternative could restore and create approximately 2.1 acres of riparian trees and shrubs, and an additional 0.7 acres of marsh/wetland plants, for a total of approximately 2.8 acres of replanted riparian habitat. As required of the Project, this alternative would be required to obtain authorization from the CDFW for the loss or disturbance of on-site riparian vegetation, potentially including issuance of a Streambed Alteration Agreement pursuant to Fish and Game Code 1602. In addition, the following mitigation measures as required of the Project would also be necessary to ensure avoidance (where possible) and restoration of riparian habitat within the Petaluma River floodway: ***Mitigation Measure Bio-5A: Riparian Preservation Zone*** (including a Riparian Preservation Zone of a minimum of 0.30 acres in size), and ***Mitigation Measure Bio-5B: Habitat Mitigation and Monitoring Plan*** to include a landscape and biological restoration plan.

- Without Terraced Grading

The Project site's riparian habitat is fully contained within the riverbank and below the top of slope, and this alternative's development area would be set back from the top of slope. Therefore, development of apartment complexes, roadways and associated improvements pursuant to this sub-alternative would not adversely affect the riparian habitat. Without terraced grading, this sub-alternative would not adversely affect on-site riparian habitat.

Waters of the US

- With Terraced Grading

The River and adjacent banks provide a total of 1.26 acres of waters of the U.S., regulated by the USF&WS and the Corps. These non-wetland waters are also considered waters of the State and regulated by the RWQCB. Terraced grading along the banks of the River could be designed to avoid direct disturbance to river water habitat (as per the Project's grading design), with construction activities confined to above the ordinary high water mark. However, terraced grading within the river floodway could result in the disturbance of jurisdictional non-wetland waters through indirect effects of hydrological interruption, alteration of bed and bank, increased sedimentation and other construction-related activities. These impacts would be temporary during the grading process. Terraced grading of the riverbanks would require authorization from the U.S. Army Corps, the RWQCB, the California Department of Fish and Wildlife, and other regulatory agencies with jurisdiction (as applicable) for the disturbance of waters of the U.S. and their associated aquatic habitat. In addition, the following mitigation measure as required of the Project would also be necessary to avoid indirect effect to aquatic habitat during construction: ***Mitigation Measure Bio-6: Terraced Grading Erosion Control/Stormwater Pollution Prevention Plan*** for all grading work and trail construction within the Petaluma River channel.

- Without Terraced Grading

All of the areas identified as being jurisdictional under Section 404 of the Clean Water Act or regulated under Section 10 of the Rivers and Harbors Act, and considered waters of the State regulated by the Regional Water Quality Control Board, San Francisco District (RWQCB) under CWA Section 401 and/or Porter-Cologne Act, are fully contained within the riverbank and below the top of slope. All grading and construction associated with this sub-alternative would be set back from the top of slope, and would not adversely affect any identified waters of the U.S. Without terraced grading, this alternative would not adversely affect jurisdictional non-wetland waters.

Protected Tree Removal

- With Terraced Grading

Two Valley oaks would be removed in order to create the terraced grading banks along the Petaluma River. The Project's proposed terrace design preserves 25 oak and riparian trees, as well as a 0.30-acre cluster of high-value willows. Similar to the Project's terraced grading plan, approximately 5 of the higher-priority native tree canopies within the existing riverbanks could be preserved, and additional lower priority trees and other riparian vegetation could also be preserved. Elsewhere on the site, it is likely that removal of many trees could be avoided through careful re-design of this reduced density alternative. Pursuant to the Petaluma River Plan, "large preservation zones and limited public access" is recommended to "better protect the important plants and animals, allow natural re-growth of these magnificent trees, and recreate a bit of local natural history." Similar to the Project, this sub-alternative would be required to implement mitigation measures consistent with the City of Petaluma's River Access and Enhancement Plan and Implementing Zoning Ordinance, including ***Mitigation Measure Bio-11A: Further Preservation of Existing Trees*** (re-designing the development plan to preserve protected trees, particularly those located within the Petaluma River Corridor Preservation Zone and those protected oaks isolated in the RODZ), ***Mitigation Measure Bio-10B: Protected Tree Replacements*** (providing for replacement of all protected trees permitted by the City to be removed), and ***Mitigation Measure Bio-10C: Tree Protection Plan*** (to ensure that all trees designated for preservation have a good chance of long-term survival).

- Without Terraced Grading

Without terraced grading, two protected large oak trees located along the top of the riverbank would not need to be removed, and all of the higher and lower priority riparian vegetation within the existing riverbank would be preserved. Like the with-terrace sub-alternative, the reduced density of this alternative would necessitate less removal of other protected oaks and redwood trees as compared to tree removal to accommodate the Project. For any tree removal that may still be required pursuant to this sub-alternative, those mitigation measures as required of the Project would still apply, including ***Mitigation Measure Bio-10A: Further Preservation of Existing Trees, Mitigation Measure Bio-10B: Protected Tree Replacements, and Mitigation Measure Bio-10C: Tree Protection***.

Hydrology

Construction-Related Pollution, Erosion and Sedimentation

- With Terraced Grading

During construction, newly graded and exposed floodplain terraces along the Petaluma River could contribute fine sediment and silt if not properly stabilized. Additionally, the operation of large construction equipment along the banks of the river could result in the contribution of petroleum

hydrocarbons and heavy metals in construction-period stormwater runoff. To address construction-period erosion and siltation, as well as the introduction of construction-related sources of water pollution, this sub-alternative would be required to demonstrate compliance with all regulatory requirements as identified for the Project, as well as implementation of ***Mitigation Measure Hydro-1: SWPPP Requirements*** to minimize erosion and control fuel/hazardous material spills.

- Without Terraced Grading

Without terraced grading, this sub-alternative would reduce the potential for erosion of newly graded and exposed floodplain, and would reduce the potential contribution of petroleum hydrocarbons and heavy metals to the River during construction-period stormwater runoff. Development on the uplands portion of the site would still be required to comply with all regulatory requirements and mitigation measures such as ***Mitigation Measure Hydro-1: SWPPP Requirements,*** as required of the Project pursuant to stormwater pollution prevention.

Base Flood Elevation with On-Site Terracing

- With Terraced Grading

Terraced grading similar to that proposed pursuant to the Project would result in a net removal of approximately 21,140 cubic yards of soil from along the riverbanks, thereby expanding the channel capacity along the Project site boundary and lowering the base flood elevation. As indicated for the Project in Chapter 11: Hydrology, terraced grading along the Project site reach would reduce the on-site 100-year floodplain boundary by nearly 1 foot at the furthest upstream location, and by 0.03 feet at the furthest downstream location. Immediately upstream of the site (from the site boundaries to the Petaluma Outlet Mall), the 100-year floodplain boundary would also be marginally reduced as compared to the current floodplain, with a lowering of the base 100-year flood by between 1.03 feet nearest the Project site's reach, and effectively no reduction upstream of the Outlet Mall. At downstream reaches of the River, terraced grading at the Project site reach would result in a relatively small decrease in base flood elevation (of 0.03 feet) immediately downstream, and a marginal increase of 0.01 feet at the confluence with Willow Brook Creek near Payran (node 0370).[6]

- Without Terraced Grading

Without terraced grading, this sub-alternative would have no effect on lowering the base flood elevations at the site or at other upstream locations.

Base Flood Elevation with Cumulative River Terracing

- With Terraced Grading

To reduce potential citywide flooding conditions, the City has adopted ordinances and General Plan policies that seek to reduce flooding and floodplain affects to the greatest extent feasible. Generally, these ordinances and policies provide for the following flood control and management provisions that are applicable to all development projects, including the Project site:

a) No development shall be permitted on lands within a 200' setback from centerline of the Petaluma River within the City's Urban Growth Boundary;

b) Properties located upstream of the Corps weir and below the confluence of Willow Brook

[6] Per West Consultants, *Sid Commons Hydraulic Evaluation*, February 22, 2017, Table 2

Creek with the Petaluma River and that are located within the floodplain, shall include a Petaluma River Corridor set-aside for the design and construction of a flood terrace system to allow the River to accommodate a 100-year storm event within a modified River channel;

c) Properties within the Petaluma watershed and outside of the City of Petaluma should not be modified in any manner that reduces stormwater storage capacity. All responsible public agencies shall work to preserve and expand detention basin capacity within the Petaluma River watershed to maintain or reduce peak discharge volumes;

d) New development within the regulatory floodplain of the Petaluma River watershed shall adhere to a zero-net fill policy in order to preserve and enhance basin capacity and to ensure no detrimental impact to downstream flows, including the increase in peak discharge volumes in the downstream areas;

e) Where appropriate, new development shall implement zero-net runoff, and assess site-specific impacts and identification of mitigations.

Terraced grading of the Project site is consistent with these citywide policies and ordinances. This sub-alternative would also maintain the 200-foot setback from the river centerline, would maintain the zero net-fill policy (would actually result in removal of approximately 21,140 cubic yards of soil from along the riverbanks), and would discharge runoff from the site in advance of peak flood flow in the River.

An analysis has been conducted to assess the flooding reduction benefits that would occur, assuming that all properties within the Petaluma watershed and outside of the City of Petaluma expand detention basin capacity, and that all other properties located upstream of the Corps weir and below the confluence of Willow Brook Creek within the Petaluma River and that are located within the floodplain (like the Project site) construct a similar flood terrace system. As indicated in the Hydrology chapter of this EIR, the beneficial effects of these floodplain management efforts would result in removal of nearly 183 acres of land from the 100-year floodplain boundary.[7]

- Without Terraced Grading

The Hydrology chapter of this EIR also analyzes the relative beneficial effects of alternative citywide floodplain management scenarios that do not include terraced grading at the Project site. That analysis concludes that much (nearly 141 acres) of the total 183 acres of floodplain reduction achieved by full implementation of all floodplain management strategies, can also be achieved solely by expanded up-stream detention capacity outside of the City of Petaluma. Approximately 77% of the total expected floodplain reduction could be achieved without terraced grading at the Project site or elsewhere along the Petaluma River. The analysis also indicates that 168 acres of land within the City could be removed from the Petaluma River floodplain if upstream detention and terraced grading were to occur only on those properties upstream of the Petaluma River Outlet Mall. Approximately 92% of the total 183 acres of expected floodplain reduction that could be achieved by full implementation of all floodplain management strategies, could also be achieved without terraced grading at the Project site or elsewhere downstream of the Outlet Mall.

Without terraced grading at the Project site, construction of any new development on this river-frontage property would not be consistent with adopted citywide ordinances and General Plan policies, and would not reduce flooding and floodplain impacts to the greatest extent feasible. Without full

[7] West Consultants, *Sid Commons Hydraulic Evaluation*, February 22, 2017.

terracing, substantial flood reductions in key areas such as the Industrial Avenue corridor, Corona and Capri Creek housing areas, and at the Outlet Mall cannot be achieved.

Environmental Analysis of Other Topics, Alternative #4

The following comparative analysis of Alternative #4 focuses on those potential environmental effects that are independent of a decision on terraced grading, and that are specific to a 149-unit multi-family apartment project located on the uplands portion of the site, only.

Light and Glare (Less than Significant with Mitigation)

Development of Alternative #4 would create new source of light or glare (though fewer new sources than the Project), which could adversely affect day or nighttime views in the area. In order to ensure compliance with the regulatory requirements for glare as found in Chapter 21 section 21.010 of the lZO, development pursuant to Alternative #4 would be required to implement ***Mitigation Visual-4: Glare Minimization Design Standards***.

Air Quality

Less than Significant Effects

Because Alternative #4 would result in development activity on a smaller portion of the site and with fewer units that the Project, Alternative #4 would not result in air quality impacts that would be greater than those analyzed under the Project. As such, all air quality impacts found to be less than significant pursuant to the Project would either be similar to, or reduced as compared to the Project, and not further discussed below. These less than significant impacts include:

- Conflict with Air Quality Plan (No Impact)
- Criteria Pollutant Emissions from Construction Activities (Less than Significant)
- Operational Air Quality Emissions (Less than Significant)
- Odors (No Impact)

Only those air quality effects that may remain potentially significant under Alternative #4 are further discussed below.

Construction Period PM10 Emissions (Less than Significant with Mitigation)

Alternative #4 would result in air quality impacts related to construction-period fugitive dust (PM10), but these impacts could be reduced with implementation of required mitigation measures. To address construction-period dust and PM10 emissions, Alternative #4 would be required to implement ***Mitigation Measure AQ-2A: Basic Dust Control***, and ***Mitigation Measure AQ-2B: Enhanced Dust Control.*** With implementation of MM AQ-2A and -2B, Alternative #4's construction period generation of PM10 would not violate air quality standards or substantially contribute to an air quality violation, and impacts to air quality from fugitive dust emissions would be reduced to levels below significance thresholds.

Construction-Period Toxic Air Contaminant Emissions (Less than Significant with Mitigation)

Construction activity associated with Alternative #4 would include use of heavy-duty off-road and on-road construction equipment for grading and construction activity throughout the site. As presented in the analysis for the Project, these construction activities would produce emissions of toxic air

contaminants that could exceed the off-site community risk and hazards threshold of significance, conservatively based on unmitigated emissions. To address these construction-period emissions, Alternative #4 would similarly be required to implement ***Mitigation Measure AQ-4: Construction-Period DPM Emission Reductions***. As indicated in the Air Quality chapter of this EIR, implementation of the control measures identified in MM AQ-4 would reduce health risk impacts related to construction activities to levels that would be less than significant.

Biological Resources

Because Alternative #4 would result in development activity on a smaller portion of the same Project site, Alternative #4 would not result in any impact to biological resources on the uplands portion of the site that would be greater than those analyzed under the Project. As such, biological resource impacts found to be less than significant pursuant to the Project would either be similar to, substantially reduced, or avoided as compared to the Project. These less than significant impacts include:

- No substantial adverse effect on candidate, sensitive or special-status plant species; and
- No impact related to conflicts with a Habitat Conservation Plan or Natural Community Conservation Plan, as no such plans apply to the Alternative #4 site.

Other than those biological resources analyzed in the with/without terraced grading analysis above, Alternative #4 would generally reduce other biological resource impacts as compared to the Project, as further described below.

Special Status Bird Species (Less than Significant with Mitigation)

With a substantially reduced development footprint as compared to the Project, Alternative #4 would reduce the number of trees to be removed from the uplands portion of the site as compared to the Project. However, it is assumed that Alternative #4 would still require certain tree removal that could result in a substantial adverse effect on candidate, sensitive or special-status bird species. To address the potential for Project-related grading and construction activities to affect special status bird species, ***Mitigation Measure Bio-2: Pre-Construction Nesting Surveys***, would be required. Required nesting surveys and the protection of any identified nests would prevent harm to special status bird species and to common types of birds that are protected pursuant to the Migratory Bird Treaty Act, and would mitigate impacts to special status bird species to a level of less than significant.

Seasonal Wetlands (Less than Significant)

With the reduced development footprint under Alternative #4 as compared to the Project, Alternative #4 could be designed such that it lessens or avoids direct removal and fill of all seasonal wetlands located on the uplands portion of the Project site, either the 0.34 acres of seasonal wetlands on the westerly side near the SMART rail lines and/or the approximately 0.28 acres of wetlands located along the upper banks of the Petaluma River immediately north of the existing Oak Creek Apartments. While Alternative #4 assumes fill of at least one of the wetlands and requires implementation of ***Mitigation Measure Bio-4: Compensation for Seasonal Wetlands Fill***, should a design be capable of retaining all on-site wetlands, then mitigation for loss of wetlands would not be required, nor would authorizations from the US Army Corps or RWQCB.

Local Policies and Regulations: Tree Removal and Tree Protection (Less than Significant with Mitigation Measures)

With the substantially reduced development footprint under Alternative #4 as compared to the Project, it is assumed that Alternative #4 could be designed such that it avoids removal of any trees from within the identified oak woodlands portion of the River Plan Corridor (including the three oak whose canopy extends into the uplands area). Additionally, the reduced number of new apartments on the site should provide additional opportunities to design around many of the other significant protected trees within the site, such that overall tree removal is substantially reduced as compared to the Project. However, Alternative #4 would still likely result in removal of certain trees to accommodate new construction of apartment buildings, the sidewalk along Graylawn Avenue and on-site roadways. Consistent with the City of Petaluma's Implementing Zoning Ordinance, Alternative #4 would be required to implement ***Mitigation Measure Bio-11B: Protected Tree Replacements and Mitigation Measure Bio-11C: Tree Protection Plan***. With implementation of these mitigation measures, Alternative #4 would comply with City of Petaluma plans, policies and ordinances regarding protected trees and the impact would be reduced to a level of less than significant.

Spreading Sudden Oak Death (Less than Significant with Mitigation Measures)

Alternative #4 could result in removal of plant materials hosting Sudden Oak Death during tree removal, but would be substantially less likely to spread Sudden Oak Death to the Petaluma River riparian habitat. Implementation of ***Mitigation Measure Bio-12A: Infected Tree Identification, Mitigation Measure Bio-12B: Tree Removal Precautions and Mitigation Measure Bio-12C: Debris Removal Precautions*** would be required, consistent with regulations addressing the handling and transport of horticultural plant stocks within and between counties and would reduce the environmental impacts associated the possible spread of sudden oak death to a level of less than significant.

Cultural Resources (Less than Significant with Mitigation)

Like the Project, Alternative #4 has limited potential to affect, directly or indirectly, the significance of a historical resource. None of the buildings and structures that formerly occupied the site retain sufficient integrity to be considered significant. However, two on-site wells may contain historic-era debris, which may hold the potential to yield information about California history. Although investigations of the site did not encounter any significant archeological resources, the Cultural Resource report indicates that areas located along the banks of the Petaluma River are known to have been occupied by the Coast Miwok, and have a heightened potential for archeological and tribal resources to be present below grade. Similarly, areas like the Project site, with alluvium soil deposits in close proximity to rivers, have been known to contain vertebrate fossils. It is possible that ground-disturbing activities associated with site preparation, grading and excavation for Alternative #4 could disturb as-yet unknown cultural resources.

The potential to uncover such as-yet undiscovered cultural resources is somewhat less likely under Alternative #4 than under the Project because Alternative #4 is further set back from the River and would have a somewhat smaller overall site area. However, the potential for future discovery remains, and mitigation measures recommended for the Project, including ***Mitigation Measure Cultural-1: Monitoring of Well Abandonment, Mitigation Measure Cultural-2: Discovery of Unknown Archaeological Resources, Mitigation Measure Cultural-3: Discovery of Unknown Paleontological Resources and Mitigation Measure Cultural-4: Discovery of Human Remains***, would also apply to Alternative #4. Implementation of the mitigation measures is consistent with the provisions of California

Health and Safety Code, and would serve to ensure that ground-disturbing activities do not adversely affect as-yet undiscovered cultural resources.

Geology

Less than Significant Effects

Because Alternative #4 would result in similar development activity but on a somewhat smaller portion of the site and with fewer units than the Project, Alternative #4 would not result in geologic impacts that would be greater than those analyzed under the Project. As such, all impacts related to geologic hazards or conditions found to be less than significant pursuant to the Project would either be similar to, or reduced under Alternative #4 as compared to the Project. These less than significant impacts include:

- Less than significant effects related to surface fault rupture, as no faults are mapped across the Project and the risk of ground rupture within the Project boundaries is considered very low;
- Less than significant effects related to liquefaction, based on detailed studies that indicate no potential for liquefaction within the development areas of the Project site;
- Less than significant effects related to landslides, because those portions of the Project site developed pursuant to Alternative #4 are generally flat and present no potential for landslide hazards. Alternative #4 would not include terracing along the Petaluma River, where bank instability may be encountered;
- No impact related to reliance on appropriate soil capabilities to support the use of septic tanks, as this Alternative would utilize the municipal sewer system present in the area;
- No impact related to the loss of mineral resources, as there are no known mineral resources on the site and no designated mineral resource sectors within the Project site or its vicinity.

Only those geologic effects that may remain potentially significant under Alternative #4 are further discussed below.

Exposure to Strong Seismic Ground Shaking (Less than Significant with Mitigation)

Alternative #4 could expose people or structures to potentially substantial adverse effects involving strong seismic ground shaking. Similar to the surrounding region, there is likely to be at least strong seismically-induced ground shaking at the Alternative #4 site from an earthquake on the Roger's Creek-Healdsburg, Hayward, San Andreas, or Maacama Faults. Pursuant to existing regulatory requirements, the following mitigation measures would be required of Alternative #4: ***Mitigation Measure Geo-2A: Compliance with California Building Code*** and ***Mitigation Measure Geo-2B: Incorporation of Geotechnical Investigation Recommendations***. Incorporation of seismic construction standards as required by these regulatory requirements would reduce the potential for catastrophic effects of ground shaking, but would reduce the hazards to a level considered acceptable by the state of California for reducing seismic risks to acceptable levels, and therefore to a level of less than significant.

Expansive Soils (Less than Significant with Mitigation)

Portions of the Alternative #4 development site may contain localized expansive soil, creating substantial risks to property. The impacts of expansive soils can be mitigated by grading and/or foundation measures that may be applicable to portions or all of the Alternative #4 site, including ***Mitigation Measure Geo-5A: Soil Treatment*** and ***Mitigation Measure Geo-5B: Foundation Design***.

Implementation of the above mitigation measures will reduce the potential impact of expansive soils to less than significant levels.

Soil Erosion (Less than Significant with Mitigation)

Although less ground disturbance would be required under Alternative #4 than under the Project, grading activities for Alternative #4 would involve disturbing and removing topsoil. During this earthwork activity, topsoil could be mobilized by storm waters and wind, thus increasing sediment loads in waterways. To address potential erosion impacts associated with the Alternative #4, ***Mitigation Measure Geo-6: Erosion Control Plan*** would be required, in accordance with the City of Petaluma's Subdivision Ordinance, and the City's Grading and Erosion Control Ordinance. Implementation of these measures would reduce the potential impact of soil erosion to a level of less than significant.

Hazards

Less than Significant Effects

Because Alternative #4 would result in development activity on a somewhat smaller portion of the site and with fewer apartment units than the Project, Alternative #4 would not result in hazards or hazardous materials impacts that would be greater than those analyzed under the Project. As such, all impacts related to hazards or hazardous materials found to be less than significant pursuant to the Project would either be similar to, or reduced under Alternative #4 as compared to the Project. These less than significant impacts include:

- Compliance with applicable regulations will ensure that construction and operation of the Project will not create a significant hazard to the public or the environment through the routine transport, use, or disposal of potentially hazardous materials.
- Required compliance with all federal state and local regulations regarding use, handling and storage of hazardous materials will minimize the risk of accidental upset or spill.
- Regulatory measures that prevent spills and provide that corrective actions be taken in the event of a spill also ensure that construction related hazardous materials do not pose a threat to schools located within ¼ mile.

Registered Hazardous Materials Sites (Less than Significant with Mitigation)

No portion of the Project site, including the Alternative #4 site, is included on a list of hazardous materials sites, including the DTSC's EnviroStor database and the SWRCB's GeoTracker database. However, a Phase I ESA report recommends that the surface soil at the site be tested for pesticides prior to development because of the former agriculture use. Implementation of ***Mitigation Measure Haz-1: Soil Testing and Regulatory Compliance***, would address the potential for residual pesticides, and the impacts regarding hazardous materials exposure will be reduced to a level of less than significant.

Hazardous Conditions - Increased Presence along Rail Tracks (Less than Significant with Mitigation Measures)

Like the Project, Alternative #4's westerly boundary is parallel and immediately adjacent to the SMART railroad right-of-way. The increased presence of residents and visitors in an area immediately adjacent to the rail tracks would result in a greater potential for rail-related accidents along this portion of the line. Alternative #4 would require implementation of ***Mitigation Measure Haz-5: Fencing*** to include appropriate fencing along the edge of and parallel to the rail tracks. Construction of appropriate fencing

along the Project's frontage to the rail tracks would reduce safety hazards associated with access onto the railroad right-of-way to a level of less than significant.

Hazardous Conditions – Rail Crossing (No Impact)

Unlike the proposed Project, Alternative #4 specifically does not include a new at-grade crossing of the SMART railroad right-of-way. Without such a rail crossing, traffic, bicycle or pedestrian hazards associated with a rail crossing (i.e., train collisions and train-related accidents) would be substantially reduced.

Emergency Access (No Impact)

Alternative #4's primary access would be from Graylawn Avenue. Petaluma Fire Code requires multiple-family residential projects having more than 50 dwelling units to be provided with two separate and approved fire apparatus access roads. Therefore, Alternative #4 (like the Project) would include a secondary means of access via a public access easement at the existing frontage at the end of Bernice Court. The Bernice Court connection would be an emergency vehicle access (EVA) only, and not a through street, and is designed to meet all fire apparatus, turning radius and turnaround requirements of the Petaluma Fire Code. The Petaluma Fire Department has reviewed this proposed EVA route and found it to provide acceptable emergency access to the site.

Land Use

Dividing and Established Community

Alternative #4 would not substantially reduce mobility or access to or through the surrounding community. This alternative would involve construction of a new apartment complex on a vacant site located on the periphery of an area that has previously been developed for residential use.

Conflict with Plans and Policies

The residential density pursuant to Alternative #4 would be partially consistent with General Plan goal 1-P-1, as it would result in development of an underutilized infill site. It would also achieve (but not to the same degree as the Project) the General Plan objectives of developing at densities that are equal to or higher than that of surrounding land uses. With 149 units on 15.45 net developable acres, this Alternative's density would be greater than the surrounding single-family neighborhoods, would result in an overall density of approximately 9.6 units per acre, and thus would be consistent with the Medium Density land use designation of the site as shown on the General Plan Land Use Map. Alternative #4 would result in a residential density consistent with the City's General Plan 2025 land use designation for the selected property (but lower than the maximum allowed).

The larger APN -009 parcel is subject to the 1982 Oak Creek Apartments Conditions of Approval, which limits future land uses on the parcel to only those uses permitted in the Agricultural District. Development of Alternative #4 would require a re-zone of this parcel, and a PUD amendment in order to remove restrictions placed on the development potential of the property.

Portions of the Alternative #4 site within APN-009 are designated as Flood Plain Combining District and Floodway Zone, based on current Federal Emergency Management Agency mapping. This alternative would be capable of achieving the City's "zero net fill" policy, and could be developed without placing any new structures within these designated areas.

Conflict with a Conservation Zone

There are no formal habitat conservation plans or natural community conservation plans that have been adopted within the City of Petaluma, but the conservation goals set forth in the City's Petaluma River Access and Enhancement Plan would apply to the Alternative #4 site. It is presumed that a design for Alternative #4's residential development could be prepared that would avoid removal of mature oak trees from within the "Oak Grove/Riparian Woodland Preservation Zone" and that could preserve more of the oaks scattered in the RODZ (APN-009) and more protected trees generally.

Noise

Because Alternative #4 would result in development on a somewhat smaller site and with fewer apartment units than the Project, Alternative #4 would not result in new noise impacts that would be greater than those analyzed under the Project. As such, all impacts related to new noise sources found to be less than significant pursuant to the Project would either be similar to, or reduced as compared to the Project. These less than significant impacts include:

- Noise due to the use and occupation of the site by new residences would not is not significantly increase or alter the existing noise environment.

Only those noise impacts that may remain potentially significant under Alternative #4, or that are substantially different than the conclusions indicated for the Project, are further discussed below.

Land Use Compatibility

Like the Project, Alternative #4 would expose new residents to ambient noise levels of between 60 to 65 dBA Ldn (which is considered to be "conditionally acceptable" for multi-family residential uses), and to reasonably foreseeable future train noise levels in excess of the 65 dBA Ldn threshold within approximately 54 feet of the rail tracks. Consistent with ***Mitigation Measure Noise-1A: Achieve "Conditionally Acceptable" Noise Levels*** and ***Noise-1B: Noise Insulation***, the design of Alternative #4 would need to place new homes no closer than 54 feet from the railroad tracks, and the design of new residential units would need to provide specific noise insulation to achieve interior noise levels of 45 dBA or lower. These measures would be capable of reducing anticipated noise conditions inside buildings to a level of less than significant.

Train Vibration

It is presumed that Alternative #4 could be designed such that no residential buildings would be constructed within 100 feet from the railroad tracks, such that ground-borne train vibration would not be transmitted into the structures. If new units were to be placed within 100-feet of the tracks, Alternative #4 would be required to implement ***Mitigation Measure Noise-2: Avoidance/Vibration Attenuation Measures*** to ensure that structural design measures are incorporated into the design of such structures, thereby reducing ground-borne train vibration to a less than significant level.

Train Horn Noise

Alternative #4 would expose new residents to reasonably foreseeable future noise from train horns. Much of any Alternative #4 site would be exposed to a "severe impact zone" (in excess of 60 dB Ldn) of train warning-horn noise from the existing Payran crossing. Noise from the train-warning horn at the Payran crossing is not attributable to development of this Alternative, but would affect the site and its new residents. Noise from the train-warning horn exceeds the 60 dB Ldn threshold and the City of Petaluma's noise impact criteria. In an effort to reduce the frequency of the sounding of train horns, the

City has established "Quiet Zone Standards" with SMART at all existing crossing within Petaluma (including at Payran). Thus, the sounding of train horns is not required, but permitted at the SMART train operator's discretion for railroad or safety reasons. Still, the Quiet Zone designation does not apply to freight trains and train horns will continue to be sounded with the crossing of some SMART trains. ***Mitigation Measure Noise-1B (Noise Insulation)*** would apply to this Alternative, requiring specific noise control treatments to achieve interior noise levels of 45 dBA or lower e.g., sound rated windows and doors, sound-rated wall construction, acoustical caulking, protected ventilation openings, stucco siding, thicker walls, bedroom orientation, etc.). Implementation of this measure would reduce noise impacts from existing train horns to a less than significant level.

Unlike the Project, Alternative #4 would not expose existing and new residents to the additional train horn noise from trains crossing the proposed Shasta Avenue Extension crossing. Alternative #4 would not be required to seek a "Quiet Zone" designation for the Shasta Avenue crossings.

Traffic Noise

Based on noise calculations prepared in 2008 and augmented with noise measurements from the 2012 Rainier EIR, the current traffic load on Graylawn Avenue (which is measured at 954 ADT, based on the traffic analysis presented in Chapter 14 of this DEIR) generates an average CNEL of 52.8 dBA at 50 feet from the roadway centerline. Under Alternative #4, all traffic generated by this alternative (estimated at 968 daily trips) would utilize Graylawn, as no Shasta Extension would be provided. This additional traffic would double existing traffic volumes, causing an increase of approximately 4 dBA in traffic noise along Graylawn, to approximately 56.8 dBA at 50 feet from the roadway centerline. This permanent increase in ambient noise levels of approximately 4 dBA would be noticeable to existing residents, but the resulting noise level would not exceed the threshold of 60 dBA for "normally acceptable" noise environments for single-family residences.

Construction Noise Impacts

Construction of Alternative #4 would result in temporary but periodically significant construction noise impacts. The Alternative #4 site is presumed as being close to the existing Oak Creek Apartments, as well as neighbors along Bernice Court, Graylawn Avenue and Jesse Avenue. Construction of this Alternative could expose these neighbors to construction noise that may occur for a year or more in duration. With required conformance with the City of Petaluma Noise Ordinance and implementation of construction-period noise mitigation measures (***Mitigation Measures Noise-4A: Construction Hours, -4B: Construction Engine Controls, -4C: Stationary Equipment and Staging, -4D: Miscellaneous Construction Noise, -4E: Noise Barriers, and -4F: Noise Disturbance Coordinator***), the majority of construction-period noise impacts would be reduced to a level of less than significant. However, because the period of construction activity may occur for a period of more than 1 year, and because certain construction activities resulting in noise levels exceeding 90 dBA Leq may occur as near as 30 feet from the nearest existing sensitive receptor and may not be able to be effectively attenuated to acceptable levels (i.e., 80 dBA) with use of available noise reduction strategies, construction noise effects on these most nearby neighbors is conservatively considered to be ***significant and unavoidable.***

Traffic and Transportation

As indicated in the description of Alternative #4, this alternative includes development of a new 149-unit apartment complex, representing approximately 54% of the Project's proposed units being clustered into a smaller overall development area. Primary access to the site pursuant to Alternative #4 would be via existing Graylawn Avenue, would not include a Shasta Avenue Extension to Graylawn across the rail

tracks, and would be dependent upon an EVA connection to Bernice Court. Using a "fitted curve" trip generation rate for a 149-unit apartment project (at approximately 7 daily trips per unit), Alternative #4 could be expected to generate a total of approximately 1,046 daily vehicle trips, 76 AM peak hour trips and 91 PM peak hour trips. This represents approximately 58% of the trips assumed as being generated by the Project.

Less than Significant Effects

Because Alternative #4 would result in approximately 58% of the vehicle trips as compared to the Project, Alternative #4 would not result in any traffic or transportation impacts that would be greater than those analyzed under the Project. As such, traffic and transportation impacts found to be less than significant pursuant to the Project would either be similar to, substantially reduced, or avoided as compared to the Project. These less than significant impacts include:

- The addition of traffic generated under Alternative #4 to existing traffic conditions would not cause a level of service standard established by the City of Petaluma to be exceeded at any study area intersections.
- The addition of traffic generated under Alternative #4 to "Pipeline" traffic conditions would not make a significant contribution of traffic under the Pipeline scenario, and the Project's impacts would be less than significant.
- Traffic generated by Alternative #4 would not cause a freeway segment operating at LOS E or better to deteriorate to LOS F, and would not cause an increase in the amount of traffic on a freeway segment already exceeding LOS E by more than one percent of the freeway segment's design capacity, under Existing, Pipeline or cumulative conditions.
- Alternative #4 would not result in a significant unanticipated increase in transit patronage beyond the system's current capacity, but potentially could result in development that is not appropriately accessible to transit riders (defined as within one-quarter mile of a transit stop).
- The design of Alternative #4's on-site circulation is presumed to be capable of adequately accommodating emergency vehicles accessing and circulating within the site.

Only those traffic and transportation effects that may remain potentially significant, or that are substantially different than the Project under Alternative #4, are further discussed below.

Cumulative Plus Project Intersection Level of Service

Under a Cumulative scenario (without Alternative #4), buildout of the General Plan would cause the Petaluma Boulevard North/Shasta Avenue intersection to operate at LOS F in the PM peak hour. Because Alternative #4 would add at least one vehicle trip to this intersection (even without the Shasta Avenue Extension to Graylawn) it would contribute to this cumulative impact. Alternative #4 would be required to pay applicable Traffic Impact Fees to be applied to necessary improvements at this intersection, pursuant to ***Mitigation Measure Transp-3: Petaluma Boulevard/Shasta Avenue***. Transportation impact fees are determined based on a project's fair share of the aggregate costs of roadway improvements. Transportation impact fees are routinely updated to reflect project timing and costs. Fair-share costs attributable to Alternative #4 are expected to be approximately 1% to 2%.

Emergency Vehicle Access

Alternative #4 would not substantially increase roadway hazards, as it would not include the Project's proposed Shasta Extension to Graylawn from west of the SMART rail tracks that includes an at-grade

crossing. Emergency vehicles would be able to approach the Project site using both Graylawn Avenue and a secondary emergency vehicle access (EVA) via a connection to the end of Bernice Court. Improvement of the Bernice Court frontage would need to provide an acceptable fire apparatus roadway meeting all turning radius and turnaround requirements of the Petaluma Fire Code to meet emergency access requirements. This impact would be less than significant.

Local Roadway Capacity

Alternative #4 would not cause an increase in traffic volumes on Graylawn Avenue that would exceed the capacity and street design standards established by the City of Petaluma. According to the Petaluma General Plan 2025 Mobility Report, Graylawn Avenue is identified as a local residential road. Pursuant to the Street Standards for the City of Petaluma, local residential roadways are intended to carry up to a maximum average of up to 2,000 daily traffic trips (ADT). Based on roadway counts collected in November 2015, Graylawn Avenue currently carries 954 vehicles per day. Adding all of Alternative #4's projected 1,046 daily vehicles to Graylawn Avenue would result in a total of 2,000 vehicles using Graylawn Avenue on an average day. Based on this assessment, the additional vehicle trips attributed to Alternative #4 would just be accommodated within the 2,000 vehicles per day design standard for a local residential road, and this Alternative would meet, but not exceed this standard on Graylawn Avenue.

This alternative would not result in construction of the Shasta Avenue Extension to Graylawn, and thus would not contribute vehicle trips to Shasta Avenue on the west side of the rail tracks.

Pedestrian and Bicycle Circulation

Based on the General Plan 2025 Mobility Report's goals and policies, walking distance greater than one-quarter mile (approximately a five to 10-minute walk) from a residential neighborhood to a retail center or transit are undesirable. Because Alternative #4 does not include a rail crossing at the Shasta Extension to Graylawn, walking distance from the Project site to retail and transit services would be approximately one-half mile along Graylawn to Payran, and would require pedestrians to cross the rail tracks at Payran Street. ***Mitigation Measure Transp-9C: At-Grade Rail Crossing Safety Measures at Payran Avenue*** would be required to provide the residents of Alternative #4 with safe and effective pedestrian and bicycle access to retail and transit facilities.

Construction Traffic

The duration of the construction period associated with Alternative #4 would likely be less than that assumed for the Project, but could still cause temporary disruption to the transportation network. ***Mitigation Measure Transp-13: Prepare Construction Management Plan*** would be required to address temporary construction impacts surrounding the Project site.

Utilities

Less than Significant Effects

Because Alternative #4 would result in similar development activity but on a somewhat smaller site and with fewer units than the Project, Alternative #4 would not result in any demands on public utilities and services that are greater than those analyzed under the Project. As such, all impacts related to utilities, which were found to be less than significant pursuant to the Project, would be reduced under Alternative #4 as compared to the Project. These less than significant impacts include:

- There are sufficient water supplies available to serve Alternative #4 from existing entitlements and resources, and new or expanded entitlements are not needed. Alternative #4 would add to the cumulative demand for overall water supplies, and contribute to projected dry year water shortages. Therefore, this Alternative would be required to include water conservation strategies that reduce overall water demands to levels projected to be sustainable on a cumulative basis, and would be subject to water shortage contingency plans that are now in place, and as may be implemented in the future.
- Wastewater generated by Alternative #4 would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board, would not necessitate construction of new or expanded wastewater treatment facilities, or result in a determination by the wastewater treatment provider that it has inadequate capacity to serve this Alternative's projected wastewater treatment demand in addition to existing commitments.
- Alternative #4 may require construction of new storm water drainage facilities or the expansion of existing facilities. Similar to the Project, the Alternative #4 site would be in relatively close proximity to the Petaluma River, such that stormwater runoff would likely be collected within an on-site storm drainage system and directed to outlets from which the stormwater would enter into the Petaluma River. All such storm drainage infrastructure would be required to comply with all provisions of the Petaluma Stormwater Management and Pollution Control Ordinance, including requirements for the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) and a Stormwater Management Plan (SMP) similar to that of the Project.
- Alternative #4 would be served by a landfill with sufficient permitted capacity to accommodate its solid waste disposal needs

Other Less than Significant Effects

In July 2007, the City of Petaluma issued a Notice of Preparation of this Draft EIR, which included a full CEQA Checklist identifying those environmental issues associated with the Project that were determined to be less than significant. Since Project-related impacts pertaining to the following CEQA topics were determined not to be significant for the Project, and because Alternative #4 is on the same site and would result in fewer residential units than the Project, the Initial Study Checklist conclusions regarding the following environmental issues would also be less than significant pursuant to Alternative #4:

- The site has not been in agricultural use for more than 30 years, and residential development pursuant to Alternative #4 would not convert any Farmland to non-agricultural use. The site is not zoned for agricultural use, and is not under a Williamson Act contract. No portion of the area surrounding the site is in active agricultural or timberland use, and development of this Alternative would not jeopardize the viability of any existing agricultural or timberland operations.
- The site is located within the urban boundaries of the City of Petaluma and does not abut wildlands. There are no wildland areas in the Project site vicinity, and the Project would therefore not result in any exposure of people or structures to risk of loss, injury or death involving wildland fires.
- The site is not located near any private airstrip, and the nearest airport is the Petaluma Municipal Airport located 2 miles to the east. The site is not included within the Airport Land Use Plan including the "conical zone" approach area, and development of the site would not result in a safety hazard for people working or residing in the area.
- At the City's average population density of 2.6 persons per household, this 149-unit Alternative could be expected to add approximately 387 new residents to Petaluma's population. This level of

population growth is not considered substantial in comparison to Petaluma's estimated population of 61,166 people, according to ABAG's population estimates for the Petaluma Sub-Regional Study Area.

- The only infrastructure improvements to be constructed pursuant to this alternative would be those necessary to enable development of the site, and would not be available to support or induce additional growth or development in the surrounding area.
- There are no existing housing units or residences on the site, and development of this alternative would not displace any existing housing units or people.
- Development of this alternative would increase the service demands of the Petaluma Fire Department and Police Department, but would not require construction of additional fire or police stations, or the expansion of any existing facilities to serve this Alternative.
- Development of this Alternative would increase the number of students attending public schools, but would not require construction of new schools beyond that already anticipated. The developer of this Alternative would be required to pay all applicable school impact fees.
- This Alternative would increase use of parks and recreational facilities, but would not require construction of new parks or recreational facilities beyond those already anticipated.

Environmentally Superior Alternative

Section 15126.6 of the CEQA Guidelines requires that an "environmentally superior" alternative be selected from among the alternatives, and the reasons for such a selection be disclosed. In general, the environmentally superior alternative is the alternative that would generate the least significant impacts. Identification of the environmentally superior alternative is an informational procedure, and the environmentally superior alternative may or may not be the alternative that best meets the goals or needs of the applicant or the City.

Alternative #1, the No Project-No Development alternative has no impacts, as it does not propose any change to the site. The No Project-No Development Alternative would be environmentally superior to the Project and all other alternatives, as no potentially significant adverse impacts would occur. However, the No Project alternative would fail to satisfy the most basic of the primary Project objectives. CEQA Guidelines Section 16126.6 (e)(2) provides that, if the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.

Avoiding or Reducing Significant and Unavoidable Impacts

As indicated in the other chapters of the Draft EIR, the proposed Project would result in several significant and unavoidable impacts, particularly those related to the Project's proposal to construct a Shasta Avenue Extension to Graylawn, crossing the SMART rail tracks. These impacts include increased hazards associated with at-grade rail crossings, including traffic, bicycle and pedestrian crossings at a potentially unsafe location.

- The Petaluma Fire Department also finds that site access via an at-grade rail crossing has a higher likelihood of blocking emergency vehicle access than does a typical street (Hazards);
- Exposure of existing and new residents to reasonably foreseeable noise from additional train horns from trains crossing the proposed new Shasta Avenue Extension rail crossing. These noise levels would be a substantial periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project (Noise);
- Increased transportation hazards due to the at-grade vehicle crossing of the rail tracks. Based on the goals, recommendation and policies of those public agencies most responsible for rail crossings, the Project's proposed at-grade rail crossing at the Shasta Extension to Graylawn is considered a significant safety hazard to traveling motorists, emergency responders and the rail carriers (Transportation); and
- Creating unsafe pedestrian and bicycle traffic flow patterns at the Project's proposed at-grade rail crossing at the Shasta Extension (Transportation).

By not including the Shasta Avenue Extension to Graylawn rail crossing as part of the Project, other secondary significant and unavoidable impacts would occur instead. Replacing the proposed at-grade crossing with a grade-separated bridge structure would eliminate most of the hazards associated with the rail crossing but would be difficult to achieve based on the limited bridge alignment options, and is not within the jurisdiction of the City of Petaluma alone. Because this alternative crossing design cannot be assured by the City as lead agency, the impact would remain significant and unavoidable. Traffic generated by the Project and relying only on use of Graylawn Avenue for access would add to existing traffic levels on Graylawn, exceeding the City of Petaluma Street Standards design capacity of this designated Residential roadway.

Environmentally Superior Alternative

Each of the alternatives do not include an at-grade rail crossing and do not generate traffic at levels that would contribute to exceeding the City of Petaluma Street Standards design capacity for Graylawn Avenue (sometimes referred to as the "livable streets" standard), and thus are environmentally superior to the Project. Each of Alternatives 2, 3A, 3B and 4 would meet this definition of being environmental superior to the Project. The environmentally superior alternative must therefore be selected from among these alternatives, so the environmentally superior alternative is defined as the alternative that would avoid or reduce environmental effects to the greatest extent.

Alternative #2 would result in new development on the APN-006 property only, and would thus develop the least amount of undeveloped land. As a result, Alternative #2 would reduce or avoid many of the biological resource impacts of the other two alternatives (e.g., wetlands fill, tree removal, loss of riparian habitat). Alternative #2 (along with Alternative #3B) would also generate the least amount of new traffic and would produce less air quality emissions as compared to the other alternatives. However, Alternative #2 would not be considered the environmentally superior alternative, because it does not achieve the central objective of realizing flood control improvements through the terracing as directed through the City's General Plan or of implementing the River Plan and creating the river trail. The City of Petaluma's decision-makers may conclude that on balance, one of the most important environmental consideration for development of this site is the ability of this property to contribute toward the City's flood management policies and regulations intended to lower flood flow water surface elevations and to help remove properties from the 100-year flood boundary to the greatest extent possible in accordance with the General Plan. If this environmental consideration were primary, then Alternatives #3A, 3B, and #4, which involve the APN-009 riverfront property that is subject to, and that would implement the City's flood management and river access and improvement policies and regulations, are superior.

Alternative #3A, as a single-family residential development, would occupy essentially the same development footprint as does the Project, and would likely not enable design opportunities to arrange new development on the site in a manner that could further avoid protected trees, avoid direct removal or filling of wetlands, or avoid noise and vibration impacts associated with the train.

Of the two remaining Alternatives (#3B and #4), Alternative #4 would result in more dwelling units and thus more cars, but its traffic and air quality impacts would be less than significant. Alternative #4's assumed land use type of higher-density apartment complex uses would likely enable design opportunities to arrange new development on the site in a manner that could avoid protected trees, avoid direct removal or filling of wetlands, and avoid noise and vibration impacts associated with the train. Alternative #4 (with terraced grading) would also come closest to attaining many of the Project's basic objectives, including:

- providing for new, relatively high-density residential development within the City of Petaluma's current Urban Growth Boundary (UGB), thereby reducing pressure to expand the existing UGB to support future residential development;
- adding to the City's stock of available multi-family housing; and
- implementing provisions of the Petaluma River Access and Enhancement Plan by improving flood control capability and increasing public access to and enjoyment of the Petaluma River.

Alternative 4, inclusive of the river terrace, would avoid many of the Project's unavoidable impacts (primarily by not including the Shasta Avenue at-grade crossing), would reduce the level of impacts

under all other environmental categories as compared to the Project (primarily due to the reduced density), and would realize a majority of the Project's objectives.

Alternative 3B would avoid most of the Project's unavoidable impacts (primarily by not including the Shasta Avenue at-grade crossing), and would reduce the level of impacts under all other environmental categories as compared to the Project (primarily due to the reduced density). Alternative #3B (and Alternative #2) would generate the least amount of new traffic, would contribute the least amount of traffic to Graylawn Avenue, and would produce less air quality emissions as compared to the other alternatives. Alternative #3B would also result in a smaller development footprint than Alternative #4, thereby providing greater opportunities to reduce or avoid many of the biological resource impacts of the other alternatives (e.g., wetlands fill, tree removal, loss of riparian habitat). Therefore, Alternative #3B, inclusive of the River terrace grading, is identified as the environmentally superior alternative.

Although environmentally superior, Alternative #3B would achieve to a lesser degree, many of the Project's basic objectives:

- Alternative #3B would provide for new, relatively high-density residential development within the City of Petaluma's current Urban Growth Boundary (UGB), but it's substantially reduced number of units (79, total) would not reduce pressures to expand the existing UGB to support future residential development to the same extent as the Project, or as Alternative #4.
- Alternative #3B would add only slightly to the City's stock of available multi-family housing.
- Although it is assumed for this EIR that Alternative #3B would implement the provisions of the Petaluma River Access and Enhancement Plan by improving flood control capability and increasing public access to and enjoyment of the Petaluma River, it is not certain that the substantially reduced development potential of this Alternative could reasonably support the financial costs associated with terraced grading. The same development potential as Alternative #3B (79 units) could also be achieved on the APN-006 parcel only (i.e., Alternative #2), where the City's terraced grading requirements would not apply.

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CEQA Conclusions

Section 15126 and 15130 of the CEQA Guidelines requires that all aspects of a project be considered when evaluating its impact on the environment, including planning, acquisition, development, and operation. As part of this analysis, the Draft EIR must also identify:

- significant environmental effects that cannot be avoided if the proposed project is implemented;
- significant irreversible environmental change that would result from implementation of the proposed project;
- growth-inducing impacts of the proposed project; and
- cumulative impacts

The following chapter of this EIR provides these required CEQA conclusions.

Summary of Significant Unavoidable Impacts

Based on the analysis presented in this EIR, the Project would result in the following environmental impacts that would be considered significant and unavoidable:

Hazards and Hazardous Materials

Rail Crossing

Impact Haz-6: The Project would result in increased hazards associated with at-grade rail crossings, including traffic, bicycle and pedestrian crossings at a potentially unsafe location, and increased presence along the rail racks.

Construction of a grade separated structure with a design that could be supported by the CPUC and the City of Petaluma (as indicated in Mitigation Measure Haz-6) may not be feasible. As such, this impact is considered a significant and unavoidable impact of the Project as proposed.

Noise

New Train Horns

Impact Noise-3: The Project would expose existing and new residents to reasonably foreseeable noise due to train horns from trains crossing the Project's proposed Shasta crossing. These noise levels would be a substantial periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project, and would result in substantial speech interference.

The Project site, as well as much of the surrounding neighborhoods, are exposed to the "severe impact zone" of noise from train warning horns at the Payran crossing. The noise from train warning horns at

the Payran crossing is not attributable to the Project, but this existing noise would adversely affect new residents at the Project site. Additionally, the Project's proposed extension of Shasta Avenue crossing would add another at-grade rail crossing. "Severe" train horn noise levels of greater than 60 dB Ldn associated with this new crossing would extend across the Project site and into adjacent neighborhoods on both the east and west sides of the railroad tracks. This new train warning horn noise would be a direct result of the Project's proposed at-grade rail crossing, would exceed FTA, FRA and City of Petaluma noise impact criteria, and would be a significant effect of the Project.

The implementation of a Quiet Zone at the Shasta Avenue crossing (as recommended pursuant to Mitigation Measure Noise-3) would significantly reduce train warning-horn noise exposure and the number of impacted people. However, the FRA has final jurisdiction over Quiet Zone applications, and neither the Project applicant nor the City of Petaluma can ensure that a Quiet Zone could be established at this crossing. Establishment of a Quiet Zone would help to reduce the frequency of warning horns at the Shasta Avenue crossing, but this measure would not mitigate noise exposure to a less than significant level. Quiet zones do not preclude the use of train horns at railroad crossings, but rather allows the train operator to use discretion in sounding horns when there is an apparent safety issue. No other mitigation measures that would reduce the impact to a less than significant level are known at this time. Therefore, this train horn impact to new residents at the Project site from the existing Payran crossing and to existing and new residents from the Project's proposed at-grade Shasta crossing is considered significant and unavoidable.

Construction Noise

Impact Noise-4: Construction activities associated with the Project would result in temporary or periodically significant noise impacts, especially where grading and construction activities are to be conducted in close proximity to existing and new sensitive receptors, specifically including the existing Oak Creek Apartments and neighbors along Bernice Court, Graylawn Avenue and Jesse Avenue.

With required conformance with the City of Petaluma Noise Ordinance and implementation of recommended mitigation measures MM Noise-4A through -4F, the majority of construction-period noise impacts would be reduced to a level of less than significant. However, because the construction period is expected to occur for a period of more than 1 year (32 months), and because certain construction activities resulting in noise levels exceeding 90 dBA Leq are expected to occur as near as 30 feet from the nearest existing sensitive receptor and may not be able to be effectively attenuated to acceptable (i.e., 80 dBA) levels at these nearby residences with use of available noise reduction strategies, construction noise effects on these most nearby neighbors is conservatively considered to be significant and unavoidable.

Transportation

Roadway Hazards and Hazards for Emergency Vehicles

Impact Transp-7: The Project would substantially increase roadway hazards and hazards for emergency vehicles accessing the Project site, due to the proposed at-grade rail crossing.

Because of the uncertainties associated with construction of a grade separated vehicle bridge as recommended in Mitigation Measure Trans-7A, and because the decision to construct such a bridge is not within the jurisdiction of the City of Petaluma alone (i.e., it specifically requires CPUC approval),

implementation of this measure cannot be assured, and the impact would remain significant and unavoidable.

Safety impacts would not be fully avoided with implementation of all at-grade safety measures as recommended in Mitigation Measure Trans-7B, and the City of Petaluma alone does not have the jurisdiction or ability to implement this measure (e.g., CPUC approval is required), and the impact would remain significant and unavoidable.

Under the scenario, whereby no Shasta Avenue Extension across the rail tracks were provided, Graylawn would provide the only primary means of access and this would conflict with the City's design standards for a local Residential Road.

Inconsistency with Adopted Bicycle and Pedestrian Plans and Policies

Impact Transp-9: The Project would create an inconsistency with adopted bicycle and pedestrian system plans, guidelines, policies and standards of the City of Petaluma.

Because of the uncertainties associated with construction of a grade separated pedestrian bridge as recommended in Mitigation Measure Trans-9A, and because the decision to construct a bridge is not within the jurisdiction of the City of Petaluma alone (i.e., it specifically requires CPUC approval), implementation of MM Transp-9A cannot be assured, and the impact would remain significant and unavoidable.

Even with all applicable safety measures as recommended in Mitigation Measure Trans-9B, the decision as to whether an at-grade pedestrian or bicycle crossing could be implemented rests with the CPUC. Since the City of Petaluma does not have jurisdiction or ability to implement MM Transp-9B, implementation of this measure cannot be assured, and the impact would remain significant and unavoidable.

Implementation of additional pedestrian and bicycle improvements at the Payran Street rail crossing (per Mitigation Measure Trans-9C) would further ensure the Project's consistency with the City's Mobility Report goals and policies for pedestrian and bicycle circulation.

Significant Irreversible Environmental Changes

Section 15126.2(c) of the CEQA Guidelines states that significant irreversible environmental changes associated with a proposed project shall be discussed, including the following:

- Uses of nonrenewable resources during the initial and continued phases of the project that may be irreversible because a large commitment of such resources makes removal or nonuse thereafter unlikely;
- Primary impacts and, particularly, secondary impacts (such as highway improvement that provide access to a previously inaccessible area), which generally commit future generations to similar uses; and
- Irreversible damage that could result from environmental accidents associated with the project.

The Project would require long-term commitment of natural resources and land. It would commit approximately 15.45 net developable acres of land that is currently undeveloped, to permanent residential use.

Project construction would result in an irretrievable commitment of nonrenewable energy resources in the form of fuel to power construction equipment, to generate electricity needed for construction, and to transport people and materials to and from construction areas. Project construction would result in an irreversible commitment of natural resources through the direct consumption of fossil fuels, primarily through use of refined petroleum products by construction vehicles. It would also require commitment of other nonrenewable resources, including lumber and other forest products for new structures, sand and gravel for concrete and building materials; asphalt for surfacing new the roads and parking areas, petrochemical construction materials such as solvents, engine coolant, and lubricants for construction machinery; steel, copper, lead and other metals for pipes, and water for dust suppression and erosion control.

Long-term changes associated with the Project would convert approximately 15.45 acres of open, undeveloped land to residential use. This use of the land would result in a long-term change, and would preclude other potential uses of the land. A 1982 PUD applies to portions of the Project site that preclude use of approximately 11.73 acres of currently vacant property to only those uses permitted in the Agricultural District as specified in the Zoning Ordinance, and that require all existing on-site trees to be permanently preserved. As part of the Project, an amendment to these PUD restrictions is requested, that would revise these conditions to enable permanent use of the land for residential use, and would permit removal of certain trees. However, the changes would occur within an area where other permanent use of the land has been used for similar residential purposes, and is allowed or contemplated under the General Plan.

Accidental spills of fuels, paints, or other chemicals could occur during construction. However, pursuant to California Health and Safety Code Sections 25500–25520, the construction contractor would be required to limit spills by training construction workers, supervising all construction work, and reporting and cleaning-up any inadvertent spills of chemicals used during construction (e.g., fuel, lubricants). The Project does not propose nor would it require the use explosives or other extremely hazardous materials (e.g., pesticides, other toxins) during construction.

Growth-Inducing Impacts of the Project

Section 15126.2(d) of the CEQA Guidelines requires a discussion of the ways in which a proposed action could be growth inducing. This includes ways in which the project would foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. In general, a project may foster spatial, economic or population growth in a geographic area if it meets any one of the criteria identified below:

- The project removes an impediment to population growth (e.g., the establishment or expansion of an essential public service to an area)
- The project results in the urbanization of land in a remote location (leapfrog development)
- The project establishes a precedent-setting action (e.g., a change in zoning or General Plan amendment approval)
- Economic expansion or growth occurs in an area in response to the project (e.g., changes in revenue base, employment expansion, etc.)

If a project meets any one of these criteria, it may be considered growth inducing. Generally, growth-inducing projects are either located in isolated, undeveloped, or underdeveloped areas and necessitate the extension of major infrastructure such as sewer and water facilities or roadways, or encourage premature or unplanned growth.

Pursuant to CEQA, growth per-se is not assumed to be beneficial, detrimental or of little significance to the environment. Secondary or indirect effects of growth can cause adverse changes to the physical environment. The indirect effects of population and/or economic growth and accompanying development can include increased demand on community services and public service infrastructure, increased traffic and noise, degradation of air and water quality, and conversion of agricultural land and open space to urban uses.

Removing an Impediment to Growth

The Project would remove an impediment to growth by its proposal to remove or revise the terms of the 1982 PUD, which applies to portions of the Project site. That prior 1982 PUD was enacted when the City of Petaluma approved a 76-unit Oak Creek Apartments project on adjacent parcel (APN -007). As part of that prior approval of the Oak Creek Apartments, a PUD zone was applied to APNs -008 and -009 (the landscaped turnaround at the terminus of Graylawn Avenue, and the northern portion of the Project site, respectively). The 1982 PUD includes the following conditions:

- Use of the 11.73-acre vacant portion of the site [i.e., APN -009] shall be limited to uses permitted in the Agricultural District as specified in the Zoning Ordinance.
- All major accesses to future developments in the remaining vacant property near the Oak Creek Apartment project [i.e., APN -009] shall be from the Rainier Avenue extension or another new public street rather than to streets to the south, such as Graylawn Avenue and Burlington Drive.
- All existing on-site trees shall be permanently preserved.

As part of the Project, the applicant proposes to amend or remove the PUD restrictions that were originally intended, in part, as an impediment to growth and development of the APN-009 parcel. The Project would achieve this amendment or removal of the PUD restrictions by re-zoning those portions of the Project site subject to the 1982 PUD, to Residential-4 (R4), consistent with the General Plan's existing Medium Density Residential designation of these properties, and consistent with the existing R4 zoning of the southern portion of the Project site (APN -006).

While the proposed re-zoning to R4 will accommodate housing growth, it would not induce other growth within the City of Petaluma beyond what is currently projected in the General Plan. The City's General Plan establishes land use development patterns and growth policies that are intended to allow for the orderly expansion of urban development supported by adequate public services, including new residential development. The City conducted CEQA environmental review on its General Plan to assess the secondary effects of its planned growth. The Project is consistent with, and has been accounted for in the programmatic analysis performed in the General Plan EIR.

Leapfrog Development

The Project site is open and covered by grass, shrubs and trees, and portions of the Project site proximate to the Petaluma River lie within the 100-year floodplain. The northerly boundary of the Project site is the Petaluma River. The Project site is located directly northwest of the existing Oak Creek Apartments, and at the northern terminus of Graylawn Avenue. The SMART tracks form the western Project boundary.

Development of the Project site would not results in urbanization of lands in a remote location. The Linda del Mar subdivision and other residential subdivisions within the Payran neighborhood lie to the south of the site, and commercial and single-family homes are located on the westerly side of the SMART tracks. Development at the existing terminus of Graylawn Avenue would be immediately

adjacent to existing development, and would not "leapfrog" over other undeveloped lands. The Project would provide for new, relatively high-density residential development within the City of Petaluma's current Urban Growth Boundary (UGB), thereby reducing pressure to expand the existing UGB to support future residential development.

Across the Petaluma River to the east is a separate vacant parcel (also owned by the Project Applicant), and other vacant lands near the Petaluma Premium Outlets lie to the northwest of the Project site, but these vacant lands do not separate the Project site from other current development.

Establishing a Precedent-Setting Action

It could be interpreted that the proposed amendment or removal of the prior 1982 PUD restrictions and re-zoning of portions of the Project site to Residential-4 zoning may establish a precedent for other similarly restricted properties within the City to seek similar changes. However, the PUD restrictions that apply to the site are unique to this site, and it is unlikely that removal of these PUD restrictions for this project would induce owners of other sites to seek similar re-zonings. Re-zoning of this site to the R4 zone would be consistent with the General Plan's existing Medium Density Residential designation for these properties, and consistent with the existing R4 zoning that surrounds much of the Project site.

Induced Economic Expansion or Growth

It is unlikely that any additional economic expansion or growth would occur in the immediate area, in response to this Project. There are separate vacant properties across the Petaluma River to the east, and other vacant lands near the Petaluma Premium Outlets, but these properties are already designated for additional development pursuant to the City General Plan. The extension of infrastructure and services to the Project site would not induce development of other properties, as these infrastructure systems would not be proximate to, or be able to serve sites other than the Project.

Rather, the Project would provide for new, relatively high-density residential development within the City of Petaluma's current Urban Growth Boundary (UGB), thereby reducing pressure to expand the existing UGB to support future residential development. The Project would also add to the City's stock of multi-family housing.

Cumulative Impacts

When evaluating cumulative impacts, CEQA envisions the use of either a list of past, present and probable future projects (including projects outside the control of the lead agency), or a summary of projections in an adopted planning document, or some reasonable combination of the two approaches. The cumulative analysis presented in this EIR relies on a reasonable combination of the two approaches, specifically using a "pipeline" list of present and probable future projects for analysis of traffic impacts, and uses development assumptions of the City's General Plan for most all other environmental topics.

Aesthetics

The City of Petaluma General Plan EIR (page 3.11-5) found that cumulative infill development or redevelopment within the city would not have a significant cumulative effect on the visual quality of the city, including the river, because new development would likely be similar in scale and character to existing development. Cumulative infill development was not expected to have a substantial adverse impact on panoramic views or create incongruous visual elements, because the height and massing of new development would be similar to existing development. In addition, due to the city's UGB and the County's Community Separators and other policies designed to protect significant visual resources,

cumulative hillside development would be minimal and unlikely to alter the visual character of the foothills surrounding the city.

Consistent with the General Plan EIR conclusion, the Project would not contribute to a significant cumulative effect on the visual quality of the city, because it will be similar in scale and character to existing surrounding development. Pursuant to MM Visual-2 (and MM Bio-10A), this EIR recommends that certain residential structures and their associated improvements be shifted to not extend into the Petaluma River Plan Corridor. Implementation of this measure would achieve greater consistency with the City's River Plan and General Plan (specifically to retain the aesthetic value of the remnant oak woodlands and other mature riparian trees which mark the location of the River in contrast to the adjacent grassy fields), and would minimize cumulative visual impacts related to loss of riparian habitat near the River.

Air Quality

Consistency with the Applicable Air Quality Plan

The City of Petaluma General Plan EIR (page 3.10-8) found cumulative development pursuant to General Plan buildout projections would be inconsistent with the Bay Area's 2005 Ozone Strategy, concluding that this would be a significant and unavoidable cumulative impact.

Since certification of the General Plan EIR, the BAAQMD has now adopted the Bay Area 2017 Clean Air Plan (2017 CAP). The 2017 CAP includes a wide range of control measures designed to decrease cumulative emissions of those air pollutants that are most harmful to Bay Area residents, to reduce cumulative emissions of methane and other potent climate pollutants, and to decrease cumulative emissions of carbon dioxide by reducing fossil fuel combustion. In general, a project is considered consistent with the 2017 CAP if it supports the primary goals of the CAP, it includes applicable control measures, and if it does not interfere with implementation of the CAP measures. Many of the 2017 Clean Air Plan's control measures are targeted to area-wide improvements, large stationary source reductions or large employers, and are not applicable to the Project. The Project would not impede implementation of air quality control measures, and would have no impact related to an inconsistency with the Clean Air Plan. Furthermore, development of the Project site with up to 278 units is consistent with the level of development anticipated pursuant to the General Plan, and would not interfere with implementation of the 2017 Clean Air Plan. Thus, the Project would not contribute to a cumulative conflict with the CAP.

Other Air Quality Effects

The City of Petaluma General Plan EIR (page 3.10-8) also found that anticipated cumulative development would have a less than cumulatively significant effect on exposure of sensitive receptors to pollutants and odors, and would not contribute substantially to an existing air quality violation.

By its very nature, air pollution is largely a cumulative impact. Generally, no single project is sufficient in size, by itself, to result in non-attainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative condition were considerable, then the project's impact on air quality would be considered significant. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Since the Project would not result in a significant air quality impact after implementation of all mitigation measures, the Project would not contribute to cumulatively considerable air quality impacts.

Biological Resources

Consistency with the Petaluma River Plan Corridor

The Petaluma General Plan acknowledges the role of the Petaluma River as a central defining feature of the City. The General Plan assumes that cumulative development will occur under sensitive development patterns along the River corridor that allow integration of land uses, recreation, and preservation/restoration goals, while implementing river terracing. The General Plan states that the Petaluma River Access and Enhancement Plan (River Plan) provides the framework for cumulative preservation and restoration of the Petaluma River Corridor.

The Project has two purposes; 1) development of the proposed Sid Commons residential neighborhood with new apartments, roadways and parking, and 2) creation of a Petaluma River terrace that includes re-contouring the western bank of the Petaluma River channel to improve citywide floodwater attenuation and conveyance during floods. This terracing project will contribute to certain cumulative impacts to biological resources along the riverbanks, including cumulative loss of riparian and oak woodland habitat.

- Preservation Zone Protection: The River Plan directs cumulative flood protection alterations to occur in an environmentally sensitive manner, but anticipates that creation of a River terrace may necessitate some cumulative habitat removal. The River Plan directs avoidance of sensitive habitat were possible, and habitat restoration, generally. The Project incorporates strategies that seek to preserve significant high priority vegetation within the existing riparian and oak woodlands habitats, and the loss of certain individual trees within the identified River Corridor for purposes of terracing is generally consistent with River Plan policies. However, the Project's proposed development plan for new apartments encroaches into the oak woodlands habitat portion of the Preservation Zone.
- Restoration Zone: The River Plan's Restoration Zone includes those portions of the riverbank and top-of-bank areas that require restoration. These areas generally have disturbed vegetation that, if stabilized and restored, could contribute significantly to cumulative wildlife and fishery habitat values and water quality. When the Project's terraced grading and replanting is completed, the amount of existing riparian and wetlands habitat in the Restoration Zone will be increased by a net of 1.17 acres of total area, and much of the lower quality habitat will be replaced by higher quality habitat planted with native trees, shrubs, and wetlands plants. The Project is consistent with the Restoration Zone policies.
- Buffer Zone: The River Plan also calls for establishment of a Buffer Zone within the Petaluma River Plan Corridor, intended to provide a degree of protection to restored and preserved habitats along the River, a transitional setback from the riverbanks to the adjacent River Oriented Development Zone, and to provide an undeveloped area in which a trail and related amenities can be located. The Project's proposed residential areas are generally outside of the Buffer Zone at the downstream half of the Project site's river frontage, but encroach into the Buffer Zone at the upstream half of the Project, inconsistent with the River Plan.

Implementation of the River Plan depends on construction of site improvements by all riverfront property owners as part of the development process. Site-specific Environmental Restoration and Management Plans area required for submittal along with development proposals, including detailed plans and specifications for City and other Resource Agency review. The Project includes a Habitat Mitigation and Monitoring Program (HMMP) that the Project applicant will be responsible for implementing, maintaining and monitoring. Approval of the HMMP is subject to the jurisdictional authority of other agencies outside of the City of Petaluma, including the US Army Corps of Engineers,

the San Francisco Regional Water Quality Control Board, and the California Department of Fish and Wildlife. The City will not issue grading permits for work within the riverbanks prior to the applicant obtaining all necessary resource agency permits and approvals, including the incorporation of all subsequent conditions and requirements of these agency approvals into the proposed grading plans.

To provide greater consistency with the Petaluma River Access and Enhancement Plan, this EIR recommends (per MM Bio-5A) that final grading plans for the Project's proposed terraced grading concept along the Petaluma River provide a Riparian Preservation Zone of a minimum of 0.30 acres in size where the preservation of existing high quality riparian vegetation shall be achieved, while still accommodating an overall widened channel design that provides acceptable flood control containment. All development (including grading and flood control alterations) is to be severely restricted within this high priority Riparian Preservation Zone, and all development (including trails, grading and flood control alterations) shall be prohibited in this Zone. This EIR also recommends (per MM Bio-5B) that additional measures be implemented to protect riparian and oak woodland trees within and abutting the riparian zone, as that zone is expanded by the river terracing project. With these additional mitigation measures, the Project would be in greater compliance with the River Plan, its impacts would be reduced to less than significant levels, and the Project's contribution to cumulative impacts to riparian and oak woodland habitat would be minimized to less than significant levels, as envisioned under the General Plan and River Plan.

Special Status Plant and Animals, and their Habitats

The City of Petaluma General Plan EIR (page 3.8-19) found that many of the sites proposed for cumulative development pursuant to the General Plan are located along or near the Petaluma River corridor, where special status plant and animal species or their habitat may occur. These special status plant and animal species or their habitat could be impacted by cumulative development along or near the River. Furthermore, cumulative development could also result in cumulative impacts on wetlands, riparian habitat, oak woodland and waters of the U.S. The Project site is one of the cumulative development sites located along or near the Petaluma River corridor, where special status plant and animal species or their habitat could be impacted by development, including impacts on wetlands, riparian habitat, oak woodland, and waters of the U.S., as more specifically described below:

- Development of the Project would not result in a significant contribution to cumulative adverse effects on candidate, sensitive or special-status plant species, either directly or through habitat modification. Based on the habitat types present and other knowledge of the site, special status plant species were determined to have either low potential for being present, or were determined to be not present at the Project site.
- Development of the Project could result in a significant contribution to adverse effects on candidate, sensitive or special-status bird and bat species, both directly and through habitat modification. However, required nesting surveys and the protection of any identified nests as required pursuant to Project-specific mitigation measures (MM Bio-2A and 2B) would prevent harm to special status bird and bat species, and would to prevent harm to more common types of birds pursuant to the Migratory Bird Treaty Act, and would mitigate the Project's contribution to cumulative impacts to special status bird and bat species to a level of less than significant.
- Development of the Project could result in a significant contribution to adverse effects on candidate, sensitive or special-status reptile, and amphibian and fish species, both directly and through habitat modification. However, limitations on the grading period, required pre-construction surveys, relocation of any special status species found, and implementation of Best Management Practices

prior to and during construction (pursuant to Project-specific mitigation measures MM Bio-3A through 3D) would reduce potential impacts of the proposed Project on special status species and sensitive habitats to a level of less than significant. It is anticipated that once construction of the Petaluma River terrace and the Project's Habitat Mitigation and Monitoring Plan is complete, cumulative habitat for these species will be restored and possibly increased as a result.

- Development of the Project will result in the direct removal and fill of approximately 0.34 acres of seasonal wetlands, contributing to cumulative losses of wetlands. However, the Project's proposed design will replace and create new seasonal and perennial wetlands, and enhance other existing wetlands habitats that are to be preserved. The replacement of seasonal wetlands with compensatory higher value wetland habitat would cumulatively benefit species of concern, and would be a desirable alternative to in-kind off-site mitigation. With implementation of measures, the Project's contribution to the cumulative loss of seasonal wetlands would be fully compensated for, such that the resulting impact would be less than significant.

The Project's proposed terraced grading plan for the banks of the Petaluma River would result in a substantial contribution to cumulatively adverse effects on riparian habitat. However, with implementation of a Riparian Preservation Zone, additional protections of riparian and oak woodland trees within and abutting the riparian zone, and implementation of the Project's Habitat Mitigation and Monitoring Plan (pursuant to Project-specific mitigation measures MM Bio-5A through 5C), the Project will preserve the maximum extent of riparian habitat while balancing the need for expanded floodway capacity within the Petaluma River. The required HMMP would result in restoration of in-kind and on-site habitat of comparable habitat value to the riparian habitat that currently exists. With implementation of identified mitigation measures, the Project's contribution to the cumulative loss of riparian habitat would be avoided to the extent feasible, and would be mitigated with compensation through post-grading restoration, such that the resulting impact would be less than cumulatively significant.

Migratory Wildlife Corridors, and Interference with Movement of Fish Species

The City of Petaluma General Plan EIR (pg. 3.8-19) concluded that cumulative development pursuant to the General Plan that may occur along the outskirts of urbanized areas in previously undeveloped sites was not found to result in exclusion of species from their normal migration routes. The City of Petaluma General Plan EIR also concluded that no cumulative development was indicated as occurring directly within the channel of any watercourse, such that no interference with the movement of any fish species would occur. The General Plan EIR concluded that cumulative development within the UGB would not interfere with the movement of fish or other wildlife species that migrate through the already urbanized areas of the City, and cumulative impacts would be less than significant.

Grading of the Project's floodway terrace adjacent to the Petaluma River, and trimming and clearing vegetation next to and within the River, may temporarily hinder the migration of aquatic and riparian wildlife species. The most significant potential impacts include the cumulative disturbance of nesting migratory songbirds and cumulative disturbance of aquatic habitat for sensitive fish species that may use this reach of the River. However, by restricting grading operations to the dry season (between June 15 and October 15) when low flow conditions are present in the River, and restricting vegetation removal to the period of June 15 to November 15 to avoid potential impacts to anadromous fish species and nesting birds (pursuant to MM Bio-7A through -7C), the Project's contribution to cumulative effects on movement of native resident or migratory wildlife species, or with established native resident or migratory wildlife corridors along the Petaluma River, would be reduced to a less than significant level.

Cultural Resources

The City of Petaluma General Plan EIR (pg. 3.12-10) concluded that cumulative development pursuant to the General Plan might result in disturbance of cultural resources during the development of properties, but that individual projects will require supplemental environmental analysis prior to implementation, in compliance with CEQA requirements. According to the Northwest Information Center at Sonoma State University, cumulative development along the Petaluma River poses a high possibility of uncovering and identifying archaeological and other cultural resources and deposits. Existing national, state, and local laws as well as policies in the proposed General Plan would reduce these potential cumulative impacts on historic and archaeological resources to less than significant levels.

According to the 2003 ARS Field Survey and subsequent 2007 WSA Field survey, no structures remain on the Project site and no significant historic resources were identified on the Project site. None of the buildings and structures that formerly occupied the site retains sufficient integrity to be considered significant, and the Project would not contribute to a cumulative loss of historic resources. To ensure that any undiscovered archeological, paleontological or tribal cultural resources are not adversely impacted by construction activities, this EIR includes mitigation measures to ensure that any potential impacts to buried, as-yet undiscovered archeological resources would be reduced to less than significant levels, such that the Project would not contribute to cumulatively adverse effects to such resources.

GHG Emissions

As noted in this Draft EIR (pg. 9-15), the BAAQMD has determined that GHG emissions and global climate change represent cumulative impacts. No single project could generate enough GHG emissions to change the global average temperature at a noticeable level, but the combination of GHG emissions from past, present, and future projects contribute substantially to the phenomenon of global climate change and its associated environmental impacts. In developing thresholds of significance for GHG emissions, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse GHG emissions impacts.

Although the Project would generate greenhouse gas emissions from both direct and indirect sources that would produce total emissions of more than 1,100 metric tons of CO2e annually, it would not generate more than 4.6 metric tons of CO_2e per service population annually, and would not fundamentally conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing greenhouse gas emissions. Therefore, the Project's contribution to cumulative GHG emissions would be less than significant.

Geology

The City of Petaluma General Plan EIR (page 3.7-23) concluded that design-controllable aspects of building foundation support, protection from seismic ground motion and slope instability are governed by existing regulations of the State of California and the City of Petaluma, and that these regulations require that all cumulative development projects include designs that reduce potential adverse soils, geology, and seismicity effects to less than significant levels. Compliance with these regulations is required, not optional. Compliance must be demonstrated by all cumulative development projects before permits for construction will be issued. Based on these requirements, the General Plan EIR found that there would be no cumulative impacts inside the UGB related to fault rupture, and no impacts related to seismic groundshaking, seismic-related ground failure, landslides, mudflows, settlement and/or subsidence of the land, lateral spreading, expansive soils or erosion.

The Project is similarly required to comply with all applicable state and local regulations pertaining to adverse soils, geology and seismicity, including the two site-specific geotechnical investigations prepared for the Project (United Soils Engineering Report [2003], and the RGH Consultant Update [2015]). Compliance with these state and local building regulations would ensure that the Project's building designs reduce potential adverse soils, geology, and seismicity effects to less than significant levels, and that no cumulative geologic hazards would occur.

Hazards and Hazardous Materials

Hazardous Materials

The City of Petaluma General Plan EIR (page 3.13-12) concluded that cumulative development within the UGB would have less than cumulatively significant impacts pertaining to development of hazardous material sites, interference with an emergency response or emergency evacuation plan, and other impacts related to routine transport, use, or disposal of hazardous materials, accidental release of hazardous materials, or hazardous emissions or use of hazardous materials in the vicinity of schools. Existing federal, State, and City regulations require that these hazards be investigated during the project planning process and measures to eliminate them be incorporated in the project design prior to completing the project approval process.

As indicated in this EIR, the Project will be required to comply with all applicable federal, State, and City regulations pertaining to hazardous materials and hazardous waste, including soil testing and regulatory compliance (pursuant to MM Haz-1) prior to issuance of building or grading permits. With required regulatory compliance, the Project will not contribute to any cumulatively significant hazardous materials impacts.

Wildland Fires

The Project site is located within the urban boundaries of the City of Petaluma, surrounded primarily by the Petaluma River and agricultural/suburban development, and does not abut wildlands. The cumulative threat of wildland fires associated with this Project is less than significant.

Hydrology

Non-Point Source Pollution

The City of Petaluma General Plan EIR (pg. 3.6-6) concluded that cumulative development pursuant to the General Plan's policies and programs would ensure that cumulative impacts from increased nonpoint source pollution and increased depletion of groundwater supply or interference with groundwater recharge would remain at less than cumulatively significant levels.

As indicated in this EIR, the Project applicant will be required to obtain all required permits and authorizations from applicable regulatory agencies, and BMP design elements are required to demonstrate how the Project's runoff will be treated in accordance with requirements of the City's Storm Water Management regulations (Municipal Code Chapter 15.80 – Stormwater Management and Pollution Control) and NPDES MS4 requirements. These regulatory requirements (itemized in Mitigation Measure Hydro-2A and -2B), will reduce the Project's contribution to cumulative effects on the quality of storm water runoff from the Project site to less-than-significant levels. Subsequent permit requirements may result in different (potentially greater) mitigation obligations based on site-specific information as determined through agency coordination.

Increased Runoff

Proposed General Plan policies and program along with additional mitigation measures would reduce significant impacts associated with increased amounts of impervious surfaces, storm drain capacity, and flooding hazards to less than significant levels.

As evaluated in this EIR, runoff from the Project site will enter the Petaluma River well in advance of when the cumulative peak flows from the upper watershed reach the site. Because the Project site is in the lower reaches of the Petaluma River watershed, stormwater flows exiting the Project site will have minimal effect on cumulative peak Petaluma River flows.

Flood Flows

The General Plan contains policies and programs to guide construction of new storm water drainage facilities and expansion of existing facilities that are needed under existing and cumulative conditions, in a manner respectful of natural habitat while allowing the City and County to address surface water flows in southern Sonoma County. As indicated in the Hydrology chapter of this EIR, significant reductions in water surface elevations throughout the Petaluma River (as compared to base or FEMA water surface elevations) can be achieved if all future cumulative development within the City subject to General Plan polices were to implement development setbacks from centerline of the Petaluma River, construct a flood terrace systems, preserve and expand detention basin capacity, and achieve a zero-net increase in peak discharge volumes.

The Project contributes to these cumulative floodplain management objectives, and is consistent with General Plan policy. The Project establishes a greater-than 200-foot development setbacks from the centerline of the Petaluma River, it includes construction of a flood terrace, and it does not substantially increase peak discharge volumes to the River. As such, the Project contributes to cumulative reductions in flood water surface elevations throughout the Petaluma River as compared to base or FEMA water surface elevations, under the assumption that cumulative conditions (or full buildout) will provide for up-stream detention and that river terracing will also occur along all identified reaches of the river. Therefore, the Project's effects pertaining to flooding and floodplain management, in combination with other cumulative development in the watershed, would be less than significant.

The full beneficial effects of lowering water surface elevations and removing properties from the 100-year flood boundary are achieved with a combination of cumulative upstream detention and cumulative downstream river terracing. The Project site is in the downstream segment of the River, and can only implement the river terracing component of this scenario. With a combination of upstream detention, terracing at the Project site, and terracing in all other reaches of the River, significant reductions in water surface elevations and significant reductions in the Petaluma River floodplain boundary (a net reduction of approximately 183 acres), as compared to base and FEMA floodplain boundaries, can be achieved. Therefore, cumulative impacts due to a change in the surface flood elevation as result of the Project's proposed river terracing would be beneficial, and not cumulatively significant.

Land Use

Physically Divide an Established Community

The City General Plan EIR concluded that cumulative development pursuant to the General Plan would not physically divide any established community. Rather, by providing better connectivity within the city through improved transportation networks and more pedestrian and bike paths, the Plan provides

better linkages within and between existing communities. The Project would not individually divide an established community or contribute to a cumulative division of established communities.

Housing Displacement

The City General Plan EIR concluded that cumulative development pursuant to the General Plan may result in removal of a very limited amount of housing in certain areas, but overall the General plan will increase the number of housing units in Petaluma, so anyone displaced will be able to find accommodation in the same area. The Project would develop currently vacant land and would not displace any existing housing.

Loss of Agricultural Lands

The City General Plan EIR concluded that cumulative development pursuant to the General Plan would occur within the present UGB, and that no land currently designated for agricultural use located outside of the UGB would be converted to non-agricultural use. Cumulative development may convert a small amount of farmland located inside the UGB to non-agricultural use, but conversion of this land would not be considered a significant impact under CEQA. Although the Project would convert currently vacant land restricted by the 1982 PUD to uses permitted with the Agricultural District as specified in the Zoning Ordinance, the Project would not contribute to a cumulatively significant loss of agricultural land.

Noise

Traffic Noise

The City of Petaluma General Plan EIR (pg. 3.9-12) found that cumulative development would have potentially significant and unavoidable impacts on exposure of sensitive receptors to traffic noise levels. However, as analyzed in this EIR, traffic generated by the Project, combined with other cumulative traffic noise in the vicinity would not result in a substantial permanent and significant increase to ambient noise levels. Cumulative traffic, plus traffic generated by the Project, would not result in a permanent increase in ambient noise levels of 4 dBA or more, and would not exceed “normally acceptable” noise levels at nearby land uses.

Train Horns

As analyzed in this EIR, the Project would expose its new residents to train horn noise from trains crossing the existing Payran crossing, and would expose both existing and new residents to a cumulative increase in train horn noise from trains also crossing the proposed Shasta Avenue extension crossing. These noise levels would be a substantial periodic increase in cumulative ambient noise levels in the Project vicinity above levels existing without the Project, and that would result in substantial speech interference. The proposed crossing of the Shasta Avenue Extension represents a significant and unavoidable contribution of new train warning-horn noise to the existing cumulative condition.

Transportation

Pipeline plus Project Intersection LOS

As concluded under Impact Transp-2 of this EIR, the addition of Project-generated traffic to the Pipeline scenario would not cause a cumulative level of service standard established by the City of Petaluma to be exceeded at any study area intersection. The Pipeline scenario includes added traffic from other development projects that are under review by the City or that the City has already approved, but which

have not yet been constructed. Although the Pipeline scenario (without accounting for the Project) would result in unacceptable intersection operations at Petaluma Boulevard North/Corona Road (LOS E during the PM peak hour), at Petaluma Boulevard/Washington Street (LOS E during the AM peak hour), and at East Washington Street/Lakeville Street (LOS E during the PM peak hour), the Project would not make a significant contribution of traffic at these intersections under the Pipeline scenario, and the Project's contribution to these cumulative impacts would be less than significant. However, the Project would be required to pay applicable Traffic Impact Fees to be used towards all cumulative traffic impacts.

Cumulative plus Project Intersection LOS

As concluded under Impact Transp-3 of this EIR, the addition of Project-generated traffic to the Cumulative scenario would not cause a cumulative level of service standard established by the City of Petaluma to be exceeded at any study area intersection. The Cumulative scenario includes added traffic from General Plan build-out conditions, and several major roadway improvements assumed as part of the Cumulative (general Plan buildout) scenario. The Cumulative scenario (without accounting for the Project) would result in unacceptable intersection operations at Petaluma Boulevard North/Shasta Avenue (LOS F in the PM peak hour) and at McDowell Boulevard/ Rainier Avenue (LOS E in the PM peak hour). The increased traffic congestion at these locations is due to the addition of new traffic generated by the future land uses projected under the General Plan, or shifting travel patterns due to the future Rainier Avenue and Shasta Avenue extensions.

- The Project would not make a significant contribution of traffic at the McDowell Boulevard/Rainier Avenue intersection under the Cumulative scenario, and the Project's contribution to this cumulative impact would be less than significant. However, the Project would be required to pay applicable Traffic Impact Fees to be used towards all cumulative traffic impacts.
- The Project would contribute to cumulative traffic impacts at the Petaluma Boulevard North/Shasta Avenue intersection, contributing to a cumulative impact during the PM peak hour caused by the combined effect of multiple new developments throughout Petaluma (including the Project), and the future Rainier Avenue and Shasta Avenue roadway extensions as projected under the General Plan 2025. Because improvements at this intersection are not included in the City Traffic Impact Fee program, the Project would be required to pay fair share contributions towards the identified improvement at this intersection (per Mitigation Measure Transp-3), that would satisfy the Project's contribution toward mitigation for this cumulative impact. With this fair-share payment, the Project's contribution to this cumulative impact would be reduced to less than significant.

Cumulative Freeway Impacts

As analyzed in this EIR, cumulative freeway volumes are projected to increase considerably in the future. Projected growth in the region will contribute to cumulative increases in both northbound and southbound traffic. Forecasts of the volumes of future freeway traffic were obtained by adding the projected growth in freeway volumes from the traffic model to existing traffic volumes. The addition of Project-generated traffic to the Cumulative scenario without the Project would not cause a cumulative level of service (LOS) standard established for the freeway system to be exceeded, and the Project's contribution to cumulative freeway traffic would be less than significant.

Utilities

Water Supply

As indicated in this EIR under Impact Utilities-1, development of the Project would take place at a residential density consistent with the General Plan, and the Project's water demands were included in the projection of cumulative water demand as analyzed in the General Plan 2025 EIR, the City's UWMP and the County UWMP. Based on the City's assumptions regarding the future availability of water to be provided by SCWA under existing agreements, and the effectiveness of water conservation and recycling efforts, cumulative development will place a less than significant demand on the City of Petaluma's available water supplies. However, long-term water supply for buildout and short-term drought year supplies both rely on the continued implementation of various phases of the City's recycled water program and water conservation programs. The Project will be subject to Chapter 15.17 of the Petaluma Municipal Code (the Water Conservation Regulations Ordinance), which contains water efficiency standards for all installed water-using fixtures, appliances, irrigation systems and any other water using devices to ensure that water is used as efficiently as possible throughout all new development projects. Long range estimates of actual and effective water supply as provided in the City's and the County Water Agency's 2015 Urban Water Management Plan indicate that, with an assumed static supply limit from SCWA, increases in cumulative water demand (including demands of the Project) will be met by conservation off-sets and use of recycled water. Cumulative impacts related to water supply, with implementation of recycled water use and conservation, are not considered to be significant.

Wastewater

The Ellis Creek Water Recycling Facility has been designed, constructed and is operated to accommodate all cumulative development within the Petaluma area, as anticipated under the 2025 General Plan. The cumulative demand for wastewater collection, treatment and disposal created by the Project, in combination with that associated with other development projects that would be completed consistent with General Plan buildout, would be accommodated by the treatment plant capacity.

Stormwater

Stormwater runoff from the Project site would not enter the City storm drainage system, and would instead outfall directed to the Petaluma River. The Project and other cumulative development would result in an increase in the total area of impervious surfaces within the Petaluma River watershed, and a related increase in stormwater runoff during storm events. In the absence of effective mitigation, this cumulative increase in the total area of impervious surface and stormwater runoff would be expected to have an effect on existing flood conditions. However, this Project (and all other cumulative development) is required to demonstrate compliance with ongoing measures intended to reduce stormwater runoff pollution, including the retention or detention of stormwater, thereby reducing this cumulative effect to less than significant.

Solid Waste

According to the Petaluma General Plan 2025 EIR, "Petaluma is focusing increasingly on waste diversion and recycling through public education and new services and facilities. These factors help accommodate the growing need for solid waste disposal while decreasing per capita solid waste disposal demand. Because Petaluma will likely continue to contract with private waste haulers who transport solid waste to several landfills, solid waste demand will not exceed landfill capacity before General Plan buildout in the year 2025." In addition, Petaluma will continue compliance efforts towards the Integrated Waste

Management Act goal of a 75 percent diversion rate of solid waste by 2020. All other reasonably foreseeable development projects proposed within Petaluma would also have the same requirement to comply with City recycling policies and all other local, State and federal regulations related to solid waste disposal. The General Plan contains policies to ensure that the solid waste generated by development would reduce the incremental or per unit demand for increased landfill capacity. Thus, the cumulative impact due to the generation of solid waste is less than significant.

Energy

As analyzed in this EIR, construction and operation of the Project would increase cumulative consumption of energy. However, the Project incorporates design measures related to electricity, natural gas and water use that require the Project to meet or exceed energy and water efficiency regulations pursuant to Title 24, CALGreen, and Tier 1 building code requirements per City of Petaluma ordinances, and as such, the Project would not result in wasteful, inefficient, or unnecessary consumption of energy.

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