4.10 TRAFFIC AND CIRCULATION

The following section is based on a traffic and circulation study prepared by Fehr & Peers, Inc. (November 2003; refer to Appendix F for technical calculations). The effects of the project have been analyzed under four scenarios: Existing, Background or Baseline Conditions, 10-Year Conditions, and Buildout of the City's General Plan (Cumulative Conditions). Baseline Conditions represent existing conditions plus traffic from already approved developments. 10-Year Conditions represents development levels anticipated in the next 10 years with reasonably foreseeable pending projects. The proposed project would result in several traffic and circulation impacts that would be considered significant but mitigable with the implementation of identified circulation improvements that would be either directly provided by the applicant, or partially funded by the applicant through the payment of fair share traffic impact fees. For those impacts that are mitigated through the payment of fair share traffic impact fees, the scheduling of associated off-site improvements cannot be determined relative to the scheduling of project implementation. Some of the mitigation measures identified for significant impacts would require the cooperation of Caltrans and/or off-site property owners, which cannot be assured. In such cases, traffic impacts are assumed as a reasonable worst-case assessment to be Class I, significant and unavoidable.

4.10.1 Setting

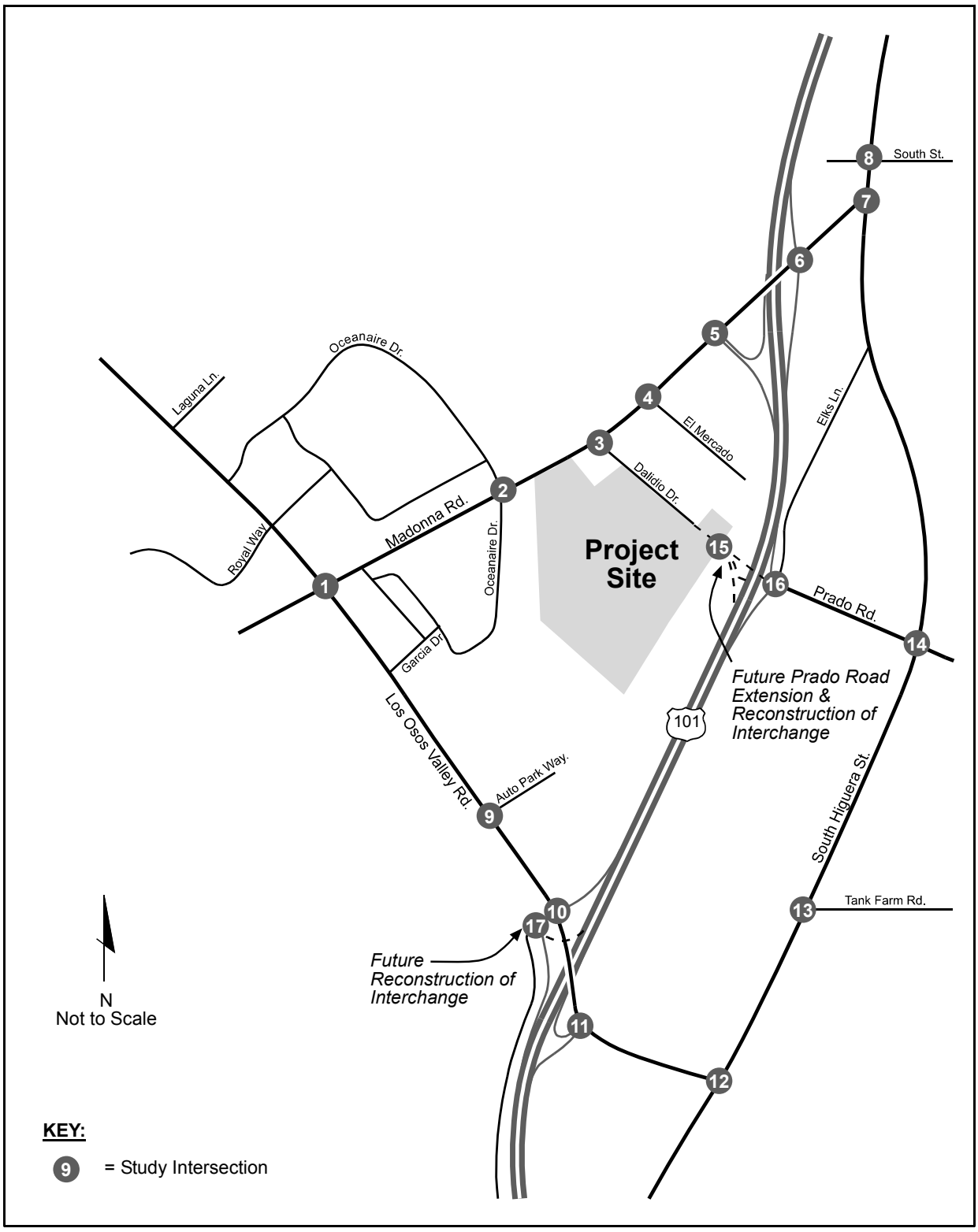
a. Existing Street System. Regional access to the proposed project is provided via interchanges on U.S. Highway 101 at Madonna Road and Los Osos Valley Road. Local access is provided by Madonna and Los Osos Valley Roads, which intersect west of the project site. Direct access to the site is provided via Dalidio Drive. Figure 4.10-1 shows the streets within the study area.

U.S. Highway 101 (U.S. 101) is a north-south, four-lane freeway through the City of San Luis Obispo. Existing access from U.S. 101 to the project site is provided via interchanges at Madonna and Los Osos Valley Roads. The existing interchange at Prado Road only serves areas east of U.S. 101.

Los Osos Valley Road (LOVR) is a two- to four-lane roadway with a northwest-southeast alignment extending between South Higuera Street in San Luis Obispo and the unincorporated community of Los Osos on the coast. LOVR includes an interchange with U.S. 101 south of the project site.

Madonna Road, which connects LOVR to South Higuera Street, is a southwest-northeast roadway that includes an interchange with U.S. 101 just north of the Madonna Plaza and SLO Promenade retail centers. Between U.S.101 and LOVR, Madonna Road is a four- to six-lane arterial with a median and limited access on the eastern segment near the shopping centers. The section of Madonna Road between the southbound U.S. 101 ramps and South Higuera Street is designated State Route (SR) 227. West of LOVR, Madonna Road narrows to two lanes and primarily serves residential uses.

Prado Road is a two-lane road extending from Elks Lane to just east of South Higuera Street. The western terminus of Prado Road includes ramps to and from northbound U.S.101. For purposes of this analysis, the roadway extended over US 101 will be referred to as Prado Road, while the section of roadway west of the freeway will be referred to as Dalidio Drive.



Source: Fehr & Peers, Inc., November 2003

Study Intersectons

Figure 4.10-1

South Higuera Street is a two- to four-lane roadway linking the western end of downtown San Luis Obispo with U.S. 101 south of the southernmost City limit (i.e., south of the LOVR interchange). This facility parallels the freeway and serves a mixture of residential and commercials uses.

Dalidio Drive, which provides primary local access to the project site, intersects Madonna Road approximately halfway between LOVR and South Higuera Street. This street currently serves as the southernmost driveway for SLO Promenade and also provides access to the adjacent Post Office. Dalidio Drive currently terminates approximately 1,200 feet east of Madonna Road.

Tank Farm Road is a two-lane roadway located on the southern edge of the City linking South Higuera Street with Orcutt Road and intersecting Broad Street (SR 227) north of the San Luis Obispo County Ariport.

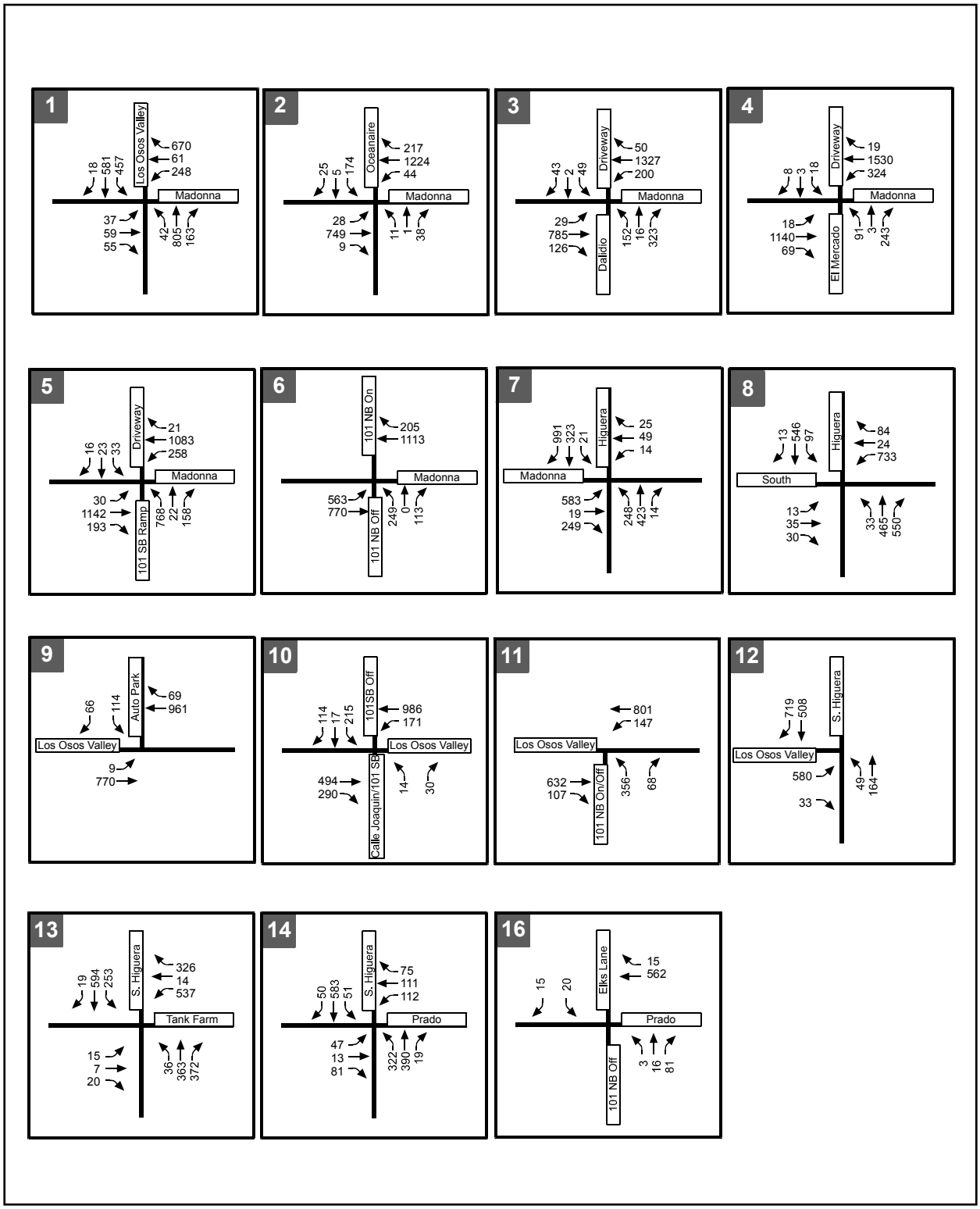
South Street is a four-lane street linking South Higuera Street (north of Madonna Road) to Broad Street along the southern edge of central San Luis Obispo. The entire section of South Street is designated SR 227.

b. Existing Traffic Volumes and Intersection Configurations. A total of 15 existing intersections are studied in this report (two new intersections will be developed as part of the project or other freeway interchange improvements). Study intersections were selected in consultation with City staff.

Existing evening (PM) peak hour traffic volumes were obtained from the City's database and represent 2001 conditions, which is consistent with the most recent available freeway data. The PM peak hour reflects the period with heaviest traffic volumes on an average weekday. The existing turning movement volumes at each of the study intersections are presented on Figure 4.10-2, and the corresponding lane configurations and traffic control devices are presented on Figure 4.10-3.

c. Existing Intersection Operations. The operation of intersections and freeway ramp junctions is measured in terms of Level of Service (LOS). LOS is a qualitative measure of traffic conditions ranging from LOS A (representing free flowing conditions with little or no delay) to LOS F (representing congested conditions with long delays and lengthy vehicle queues). The City maintains LOS D as the minimum acceptable level of service for intersections (i.e., LOS E and F are considered unacceptable operations). Although Caltrans strives to maintain LOS C operations on state-operated facilities, LOS D is considered acceptable in developed areas such as San Luis Obispo. Operational analysis of the study intersections is based on the methods and procedures described in the 2000 *Highway Capacity Manual (HCM)* published by the Transportation Research Board.

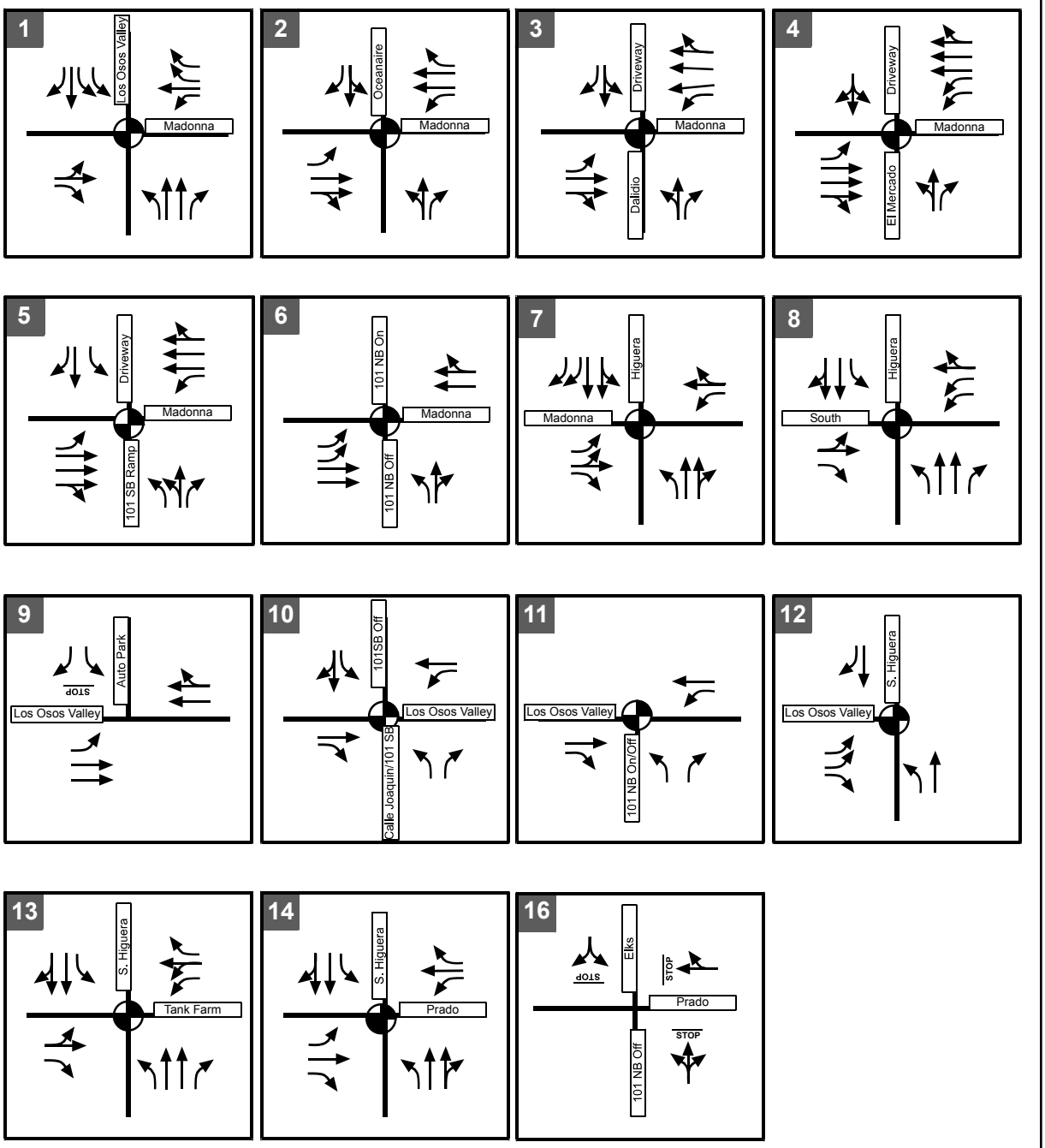
Signalized intersection operations were analyzed using the SYNCRHO software program to illustrate the effect of adjacent signalized intersections. This program is a comprehensive analysis tool that produces a variety of output data for intersection and arterial operating performance including the effectiveness of signal interconnection. Table 4.10-1 presents the service level criteria used for signalized intersections based on average control delay per



Source: Fehr & Peers, Inc., November 2003

Existing PM Peak-Hour Volumes

Figure 4.10-2



Source: Fehr & Peers, Inc., November 2003

Existing Lane Configurations

Figure 4.10-3

vehicle as described in Chapter 16 of the 2000 HCM, where control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration.

Table 4.10-1 Signalized Intersection Service Level Criteria

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	≤ 10
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10 and ≤ 20
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20 and ≤ 35
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35 and ≤ 55
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55 and ≤ 80
F	Operations with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80

Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, 2000

Unsignalized intersections were analyzed using the methodology described in Chapter 17 of the 2000 HCM. This methodology calculates the overall intersection control delay for intersections controlled by stop signs. For intersections with stop signs on the side street only, the operating level of the side street governs operations since the main street traffic is not substantially delayed. At all-way stop controlled intersections, an overall intersection delay is calculated. Table 4.10-2 presents the ranges of control delay and corresponding levels of service for unsignalized intersections.

Table 4.10-2 Unsignalized Intersection Service Level Criteria

Level of Service	Description	Average Total Delay Per Vehicle (Seconds)
A	Little or no delay	≤ 10
B	Short delays	> 10 and ≤ 15
C	Average delays	> 15 and ≤ 25
D	Moderate delays	> 25 and ≤ 35
E	Lengthy delays.	> 35 and ≤ 50
F	Intolerable delays.	> 50

Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, 2000.

To fully address the impacts of the proposed project at the LOVR/Madonna Road intersection, the analysis includes the effect of pedestrian crossings. This is an important consideration at this intersection because of its unusual phasing and pedestrian crossing requirements, and the number of pedestrians crossing LOVR during the PM peak hour. This intersection links residential areas to commercial areas and several schools. These factors dictate the overall cycle length of the intersection and require that some phases be longer than needed (for vehicles only) to accommodate pedestrians, thereby reducing overall vehicle capacity. Thus, any

additional vehicular and pedestrian traffic added to this intersection could cause a proportionally higher impact than at a conventional intersection with few pedestrian crossings. Field observations were used to verify the estimated number of pedestrians crossing each approach, the proportion of signal cycles utilized by pedestrians, and the average number of pedestrians arriving together. The amount of green time allocated to each signal phase was then adjusted to accommodate the level of pedestrian activity on each approach. This adjustment is carried through all existing and future scenarios and was also applied to all Caltrans-maintained intersections per District 5 operations staff request.

The existing peak hour volumes, lane configurations, and signal timings were input to the SYNCHRO program to calculate the level of service at each of the signalized and unsignalized study locations. Table 4.10-3 summarizes the existing intersection PM peak hour Levels of Service. The existing conditions analysis includes the analysis of the Madonna Road traffic signals, between Oceanaire Drive and El Mercado, as an interconnected or coordinated system. The remaining intersections are assumed to not be interconnected or coordinated.

Table 4.10-3 Existing Intersection Service Levels

Intersection	Traffic Control	PM Peak Hour	
		Avg. Delay (sec/veh)	LOS
1) Madonna Rd./Los Osos Valley Rd.	Signal	41	D
2) Madonna Rd./Oceanaire Dr.	Signal	10	B
3) Madonna Rd./Dalidio Dr.	Signal	32	C
4) Madonna Rd./El Mercado	Signal	24	C
5) Madonna Rd. / 101 Southbound Ramps	Signal	34	C
6) Madonna Rd. / 101 Northbound Ramps	Signal	31	C
7) Madonna Rd./Higuera St.	Signal	19	B
8) South St./Higuera St.	Signal	17	C
9) Los Osos Valley Road/Auto Park Way	Stop Sign[1]	10 (> 90)	A (F)
10) Los Osos Valley Road/101 Southbound Ramps	Signal	20	C
11) Los Osos Valley Road/101 Northbound Ramps	Signal	16	B
12) Los Osos Valley Road/Higuera St.	Signal	10	A
13) Higuera St./Tank Farm Rd.	Signal	20	B
14) Higuera St./Prado Rd.	Signal	15	B
15) Prado Rd./U.S. Highway 101 NB Ramps	Stop Sign[1]	< 16 (18)	C (C)

[1] *Overall intersection delay is presented with delay for the worst movement in parentheses.*
Source: Fehr & Peers Associates, 2003.

Table 4.10-3 indicates that all of the signalized study intersections operate at an acceptable LOS D or better based on existing traffic volumes. The unsignalized LOVR/Auto Park Way is estimated to operate at an overall LOS A during the PM peak hour. A detailed review of the LOS calculation worksheet shows that the worst movement, southbound left-turns exiting Auto Park Way, is operating at LOS F (delay is greater than 90 seconds).

d. Peak Hour Signal Warrants. Based on the worst-case movement LOS F operations projected at the unsignalized LOVR/Auto Park Way intersection, peak hour traffic signal warrant criteria from the Caltrans *Traffic Manual* were evaluated for existing PM peak hour conditions. The volume criteria for Warrant #11 were used to determine the need for a signal at this location. Based on a volume of 180 vehicles on Auto Park Way during the PM peak hour, a traffic signal is warranted at this location under Existing Conditions. However, satisfaction of a warrant does not necessarily require installation of a traffic signal as indicated in the *Traffic Manual*. Other factors such as delay, driver confusion, safety, etc., should be considered. The

City of San Luis Obispo will make the final determination on the need for a signal at this location.

e. Existing Baseline Freeway Ramp Junction Service Levels. Operations on freeways are governed by merge and diverge areas where vehicles enter and exit the freeway mainline. Besides merging and diverging activities, the crossing of vehicles as they change lanes to enter or exit the freeway (i.e., weaving) also affects freeway operations. Freeway ramp junction operations on U.S. 101 were evaluated between the Madonna Road and Los Osos Valley Road interchanges and included the Prado Road interchange. These are the three interchanges that would be utilized by traffic from the proposed project. The analysis evaluates ramp operations where they junction with the mainline freeway, either as a merge, a diverge, or a weaving section if an auxiliary lane exists.

The analysis of freeway ramp junctions was completed based on the methodology described in Chapter 26 of the 2000 HCM for all standard merge and diverge locations. Freeway ramp merge/diverge operations are evaluated based on density or the number of passenger cars per hour per lane-mile. The Highway Capacity Software was used to evaluate freeway junction operations. Table 4.10-4 lists the range of density that corresponds to each level of service.

Table 4.10-4 Freeway Density Service Level Criteria

LOS	Density
A	≤ 10
B	$10.0 < \text{density} \leq 16.0$
C	$16.0 < \text{density} \leq 24.0$
D	$24.0 < \text{density} \leq 46.0$
E	$46.0 < \text{density} \leq 55.0$
F	> 55.0

Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, 2000.

Caltrans' *Highway Design Manual* nomographs (weaving analysis charts) were used to analyze weaving sections for areas where vehicles must cross between an entrance ramp and downstream exit ramp. This typically occurs when an auxiliary lane is present.

Currently, U.S. 101 has two travel lanes in each direction in the vicinity of the project. There are no plans to construct additional travel lanes through San Luis Obispo, but auxiliary lanes are being considered between the three interchanges. Presently, an auxiliary lane exists in both directions between Madonna Road and Marsh Street.

For existing conditions, freeway mainline volumes were obtained from 2001 counts and ramp volumes were calculated from the adjacent ramp terminal intersection. The existing freeway mainline and ramp volumes are illustrated on Figure 4.10-4. Table 4.10-5 presents the existing freeway merge/diverge service levels at ramp junctions. Presently, all merge/diverge ramp junctions operate at an acceptable level (LOS D or better).

Table 4.10-5 Existing Freeway Ramp Junction Service Levels

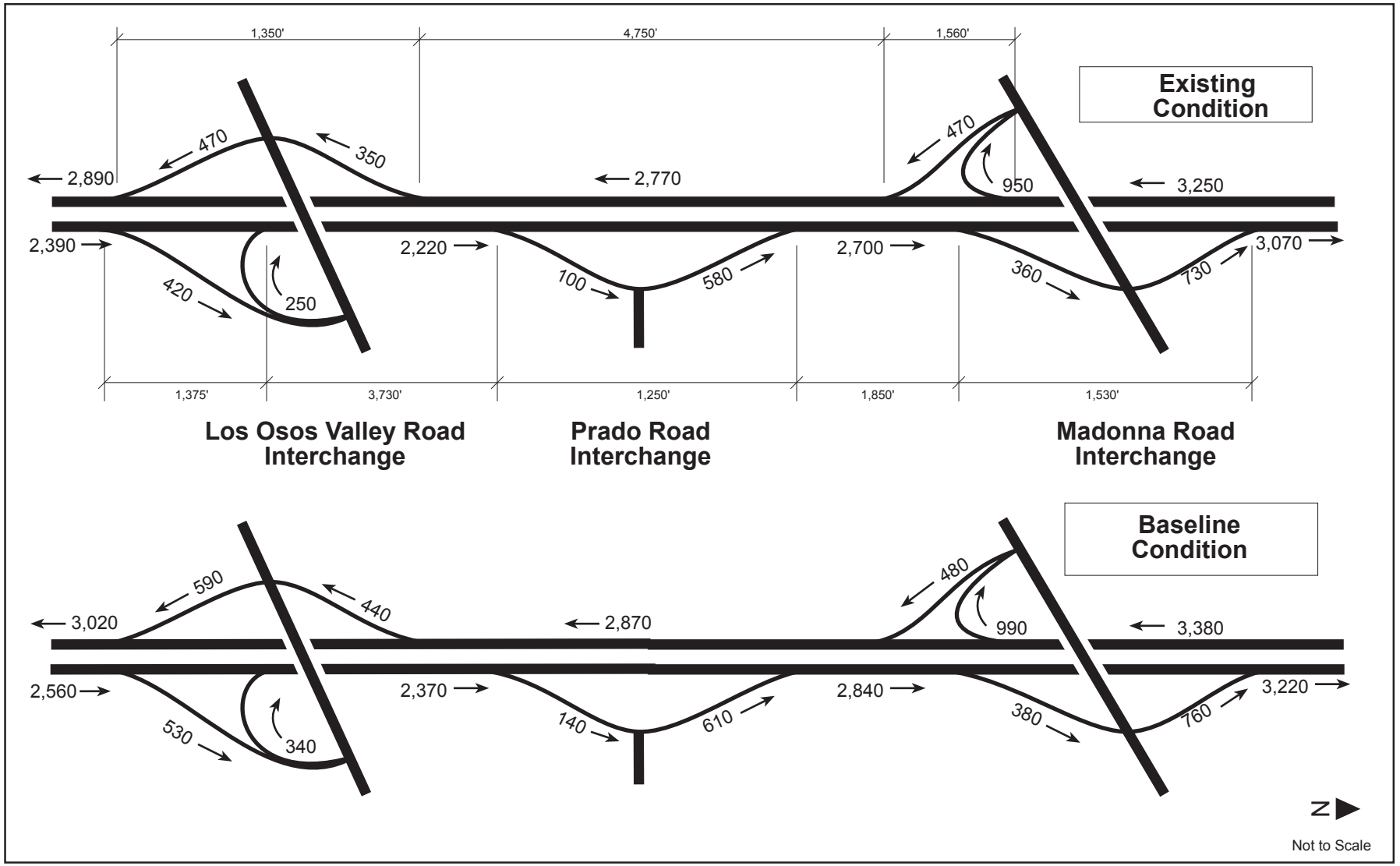
Ramp Location	PM Peak Hour Conditions	
	Density	Merge/Diverge LOS
Southbound Ramps		
Madonna SB On	24.5	C
LOVR SB Off	24.6	C
LOVR SB On	25.5	C
Northbound Ramps		
LOVR NB Off	21.2	C
LOVR NB On	20.2	C
Prado NB Off	19.7	B
Prado NB On	23.9	C
Madonna NB Off	24.0	C

Notes: Operations calculated using Highway Capacity Software.
Source: Fehr & Peers Associates, Inc., 2003.

f. Existing Neighborhood Traffic. The closest residential development to the project site is located to the south and west of the site. Congestion at the Madonna Road/LOVR intersection has previously raised questions regarding the amount of "cut-through" traffic that uses Oceanaire Drive north of Madonna Road. Two of the higher volume movements governing operation of the intersection are the westbound right-turn volume from Madonna Road to LOVR and the southbound left-turn volume from LOVR to Madonna Road. Queues form on both of these movements resulting in temporary delays, but the intersection is currently operating at LOS D and no excessive delays were observed on a typical weekday. Some residents in the adjacent neighborhood (north of Madonna Road and east of LOVR) have indicated that traffic cuts through the neighborhood on Oceanaire Drive to avoid waiting at the Madonna Road/LOVR signalized intersection. Previous reviews of the intersection count data at Madonna Road/LOVR and Madonna Road/Oceanaire Drive did not show an obvious pattern of cut-through traffic during the peak hours, when congestion was at its worst during the PM peak hour.

To address this issue, a 48-hour traffic count was conducted in May 2003 on Oceanaire Drive north of Madonna Road to determine the average daily traffic volume. This count showed ~~a~~ an average volume of 5,400 vehicles per day (vpd), which is ~~substantially~~ higher than the volume of ~~2,300~~ 4,600 (vpd) counted three years ago. The land uses in this area include over 460 dwelling units and the 380-student C.L. Smith Elementary School that serves the immediate neighborhood as well as residential areas to the north and west. These uses would be expected to generate approximately 4,970 trips per day, but this traffic would be distributed to three locations: 1) the Madonna Road/Oceanaire Drive intersection, 2) the LOVR/Oceanaire Drive intersection, and 3) the LOVR/Royal Way intersection. Thus, the existing daily volume on Oceanaire Drive is higher than expected. Street volumes can fluctuate during seasonal or special event functions such as evening activities at the elementary school.

The City of San Luis Obispo addresses residential traffic issues in its 1998 *Neighborhood Traffic Management (NTM) Guidelines* and in the *Circulation Element* of the General Plan. In the NTM Guidelines, a "maximum desired average daily traffic (ADT) volume" has been established for various street classifications. Oceanaire Drive is classified as "Residential Collector" with a maximum desired ADT of 3,000 vehicles per day. The existing volume at this location exceeds the City's guidelines.



Freeway and Ramp PM Peak-Hour Traffic Volumes
Under Existing and Baseline Conditions

Source: Fehr & Peers, Inc., November 2003

Figure 4.10-4

The posted speed limit on Oceanaire Drive is 25 miles per hour and there are several stop signs located at cross streets between the intersections at Madonna Road and LOVR. Although this design is not considered attractive to "cut-through" drivers, the potential for cut-through traffic on this street does exist and would likely increase with substantial degradation of operations at the Madonna Road/LOVR intersection.

g. Existing Bicycle and Pedestrian Facilities. Bicycle facilities comprise bike paths, bike lanes, and bike routes. Bike paths (Class I) are paved pathways separated from roadways. Bike lanes (Class II) are lanes for bicyclists adjacent to the outside vehicle travel lanes. These lanes have special lane markings, pavement legends, and signage. Bike routes are generally located on low traffic volume streets that provide alternative routes for recreational, and in some cases, commuter and school children cyclists. These facilities are designated Class III and are signed for bike use, but have no separated bike right-of-way or lane striping.

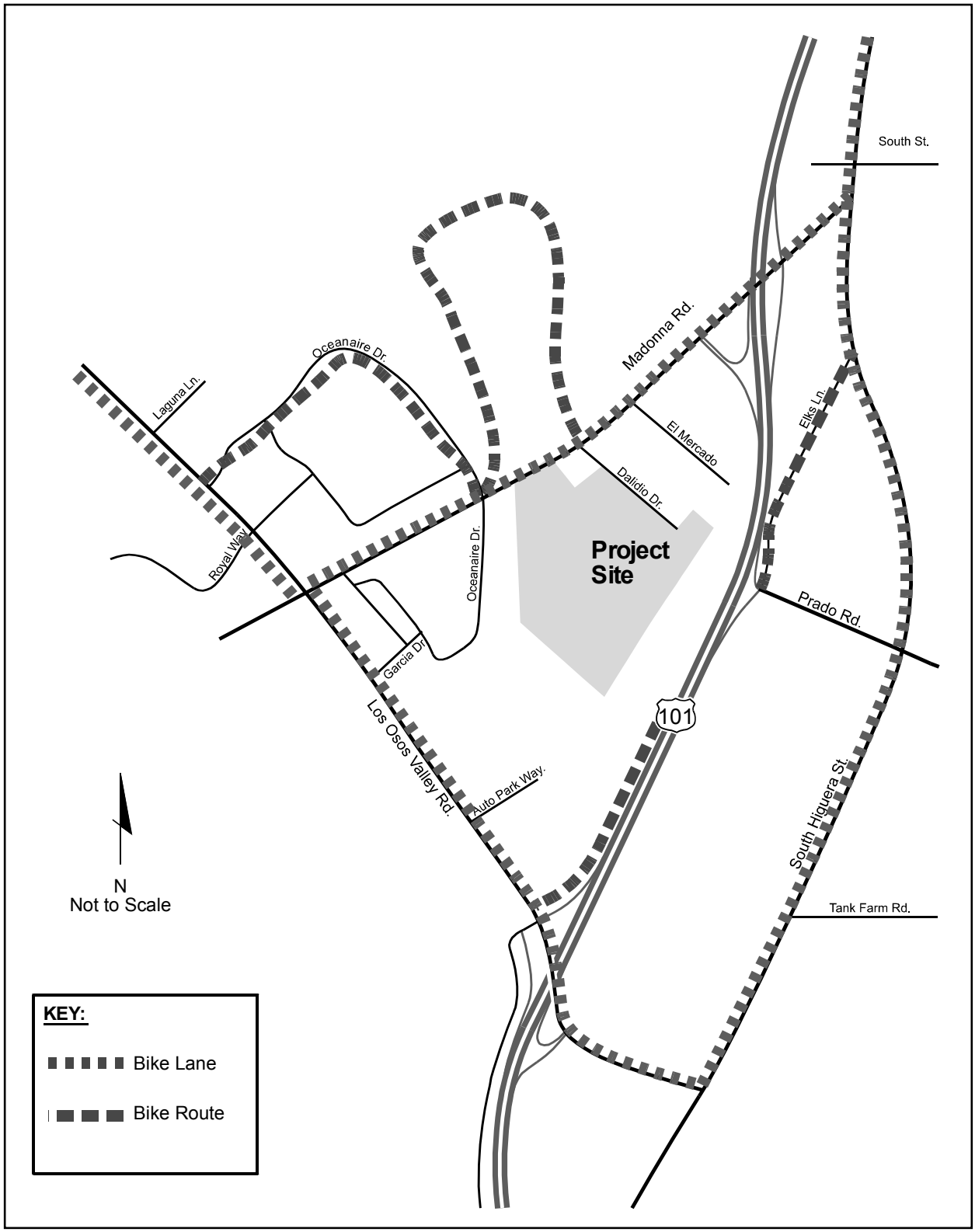
No Class I bike paths are located in the vicinity of the project site. Bike lanes are striped in both directions on portions of South Higuera Street and LOVR, as well as the entire length of Madonna Road east of LOVR. The South Higuera Street lanes are striped between LOVR and Nipomo Street in the downtown area. The LOVR lanes are striped from the western city limits to South Higuera Street. The LOVR overpass at U.S. 101 does not have bike lanes, but does have narrow striped shoulders that could serve bicyclists. Bike lanes are also provided on Tank Farm Road.

Bike routes are provided along frontage roads that are parallel to U.S. 101 and in areas north of Madonna Road. A bike route is located on Elks Lane on the east side of U.S. 101 between Prado Road and South Higuera Street. The entire length of Oceanaire Drive is a bike route, and bike routes are also provided in Laguna Lake Park. The locations of all of existing bike facilities are shown on Figure 4.10-5.

Pedestrian facilities are comprised of sidewalks, crosswalks and pedestrian signals at signalized intersections. In the vicinity of the project site, sidewalks are located on both sides of Madonna Road except for several small segments: including the south side of the street adjacent to the western portion of the project site; along the north side of the road extending from the northbound on-ramp across the bridge to the Madonna Inn's entrance driveway; and along the south side of Madonna Road from the northbound off-ramp to the entrance driveway of the Caltrans parking area.

Evaluation of pedestrians is emphasized at the Madonna Road/LOVR intersection because it is a critical crossing point within the study area. Crosswalks and pedestrian signals are provided on all approaches of the Madonna Road /LOVR intersection. Pedestrian activity at this intersection is expected to increase due to the continuing development of residential uses at DeVaul Ranch and the proximity of commercial uses including the Laguna Shopping Center at the Madonna Road/LOVR intersection and the location of schools on the east side of LOVR.

To accommodate this activity, the City implemented a unique phasing plan at the Madonna Road/LOVR intersection to increase pedestrian service. Pedestrians using the crosswalk are given right-of-way at the north leg of the intersection at the same time as northbound right turns from LOVR to Madonna Road and also when westbound lefts occur from Madonna to LOVR. This phasing plan, while not the most efficient for vehicle capacity, is a trade-off to minimize pedestrian and vehicle conflicts at a location with both high pedestrian and vehicle



Source: Fehr & Peers, Inc., November 2003

Existing Bike Facilities

Figure 4.10-5

volumes. Pedestrian calls at signalized intersections (when pedestrian push buttons are activated) increase the green time for various signal phases beyond the time needed to clear vehicles alone. This is because pedestrian calls increase the minimum timing so that pedestrians can reach the far side of the street. Generally, pedestrian calls increase vehicle delay at intersections. Pedestrian counts in 2003 showed that up to 25 pedestrians crossed at least one leg of the intersection during the PM peak hour. The proportion of signal cycles during the PM peak hour with pedestrian calls was approximately 45 percent. Since the LOS calculations include pedestrian crossing times for every cycle (i.e., 100 percent), the LOS calculations are considered conservative.

h. Existing Transit Service. SLO Transit operates bus service in the vicinity of the proposed project. Two of the six fixed routes directly serve the project site: Routes 4 and 5. Both routes have stops in the SLO Promenade retail center located immediately north of the project site. Figure 4.10-6 also shows the transit routes within the study area. The following is a brief description of the key bus routes.

Route 4 provides one-way service via a loop route beginning at City Hall using the following major streets: Osos Street, Santa Barbara Street, South Street, Madonna Road, LOVR, Foothill Boulevard, California Boulevard, Grand Avenue, and Mill Street. Service is provided at 34-minute headways between 6:12 AM and 7:19 PM on weekdays only. Weekend and holiday service is provided between 7:55 AM and 5:44 PM at 66-minute headways.

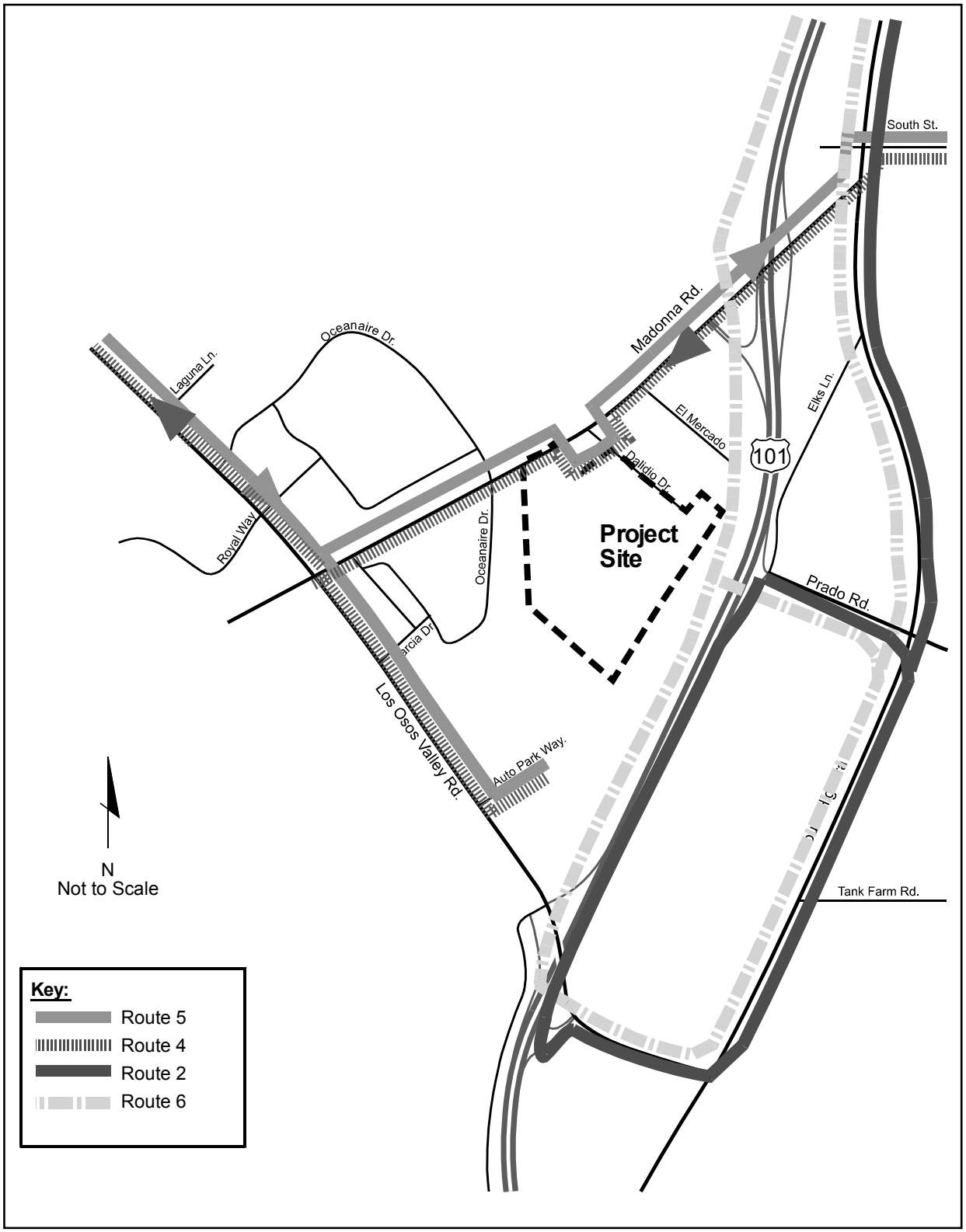
Route 5 provides service to the same locations as Route 4 but in the opposite direction. Service is provided from 6:08 AM to 7:39 PM at 34-minute headways on weekdays. On weekends and most holidays, service is provided at 66-minute headways between 7:52 AM and 5:59 PM. This route does not travel on Madonna Street between Dalidio Drive and El Mercado.

Routes 2 and 6 operate in the Higuera Street and US 101 corridors with Route traversing Prado Road immediately east of the freeway. However, these routes do not serve the site directly.

i. Background/Baseline Traffic Volumes. Traffic from approved (but not yet constructed) developments, was added to existing volumes to identify existing baseline conditions against which project impacts were identified. Major projects included under this scenario are: Home Depot, the undeveloped portion of DeVaul Ranch, Copeland's, Trader Joe's, Cannon Office, and AeroVista commercial. Traffic projections from these projects were obtained from the traffic study for the Costco Froom Ranch Draft EIR. A detailed list of approved projects and the associated estimated traffic volumes generated by these uses is included in Appendix F. Figure 4.10-7 presents the baseline intersection turning movement volumes at the study intersections.

j. Background/Baseline Intersection Operations. Operations of the 15 existing intersections were analyzed using existing volumes plus the addition of approved development traffic as described in Section j above. The existing lane configurations were used to analyze baseline conditions. The results of the intersection analysis under Baseline Conditions are shown in Table 4.10-6.

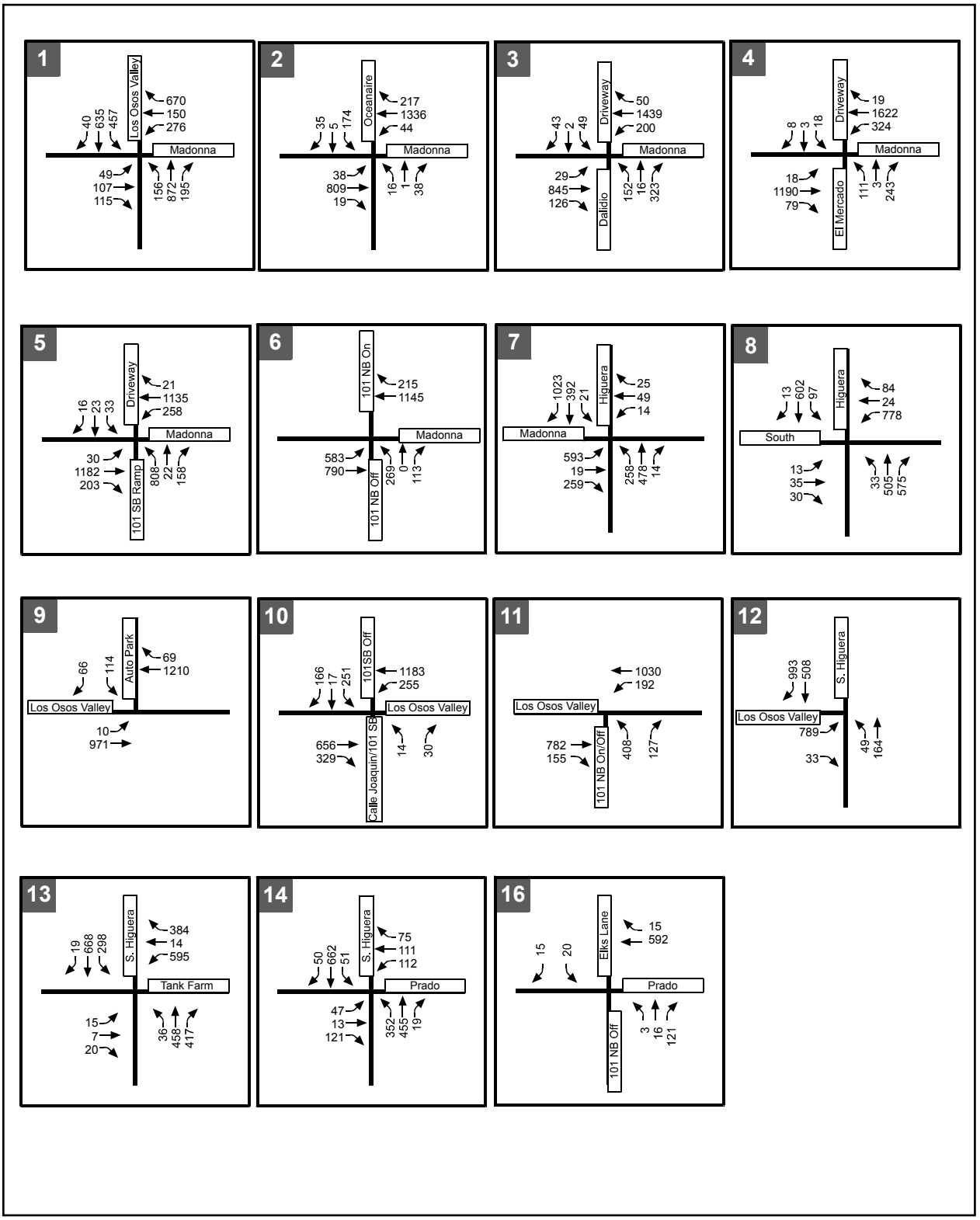
The addition of background traffic is expected to degrade operations from an acceptable level to an unacceptable level (LOS E) at the intersection of Los Osos Valley Road and US 101 Southbound Ramps. The overall operations of the LOVR/Auto Park Way intersection are



Source: Fehr & Peers, Inc., November 2003

Existing Transit Routes

Figure 4.10-6



Source: Fehr & Peers, Inc., November 2003

Baseline PM Peak-Hour Volumes

Figure 4.10-7

projected to degrade from LOS A to LOS D (worst movement is projected to operate at LOS F). All other locations are expected to operate at LOS D or better during the PM peak hour.

Table 4.10-6 Baseline Intersection Service Levels

Intersection	Traffic Control	PM Peak Hour	
		Avg. Delay (sec/veh)	LOS
1) Madonna Rd./Los Osos Valley Rd.	Signal	52	D
2) Madonna Rd./Oceanaire Dr.	Signal	11	B
3) Madonna Rd./Dalidio Dr.	Signal	30	C
4) Madonna Rd./El Mercado	Signal	21	C
5) Madonna Rd. / 101 Southbound Ramps	Signal	36	D
6) Madonna Rd. / 101 Northbound Ramps	Signal	33	C
7) Madonna Rd./Higuera St.	Signal	20	C
8) South St./Higuera St.	Signal	18	B
9) Los Osos Valley Road/Auto Park Way	Stop Sign[1]	25 (> 60)	D (F)
10) Los Osos Valley Road/101 Southbound Ramps	Signal	67	E
11) Los Osos Valley Road/101 Northbound Ramps	Signal	40	D
12) Los Osos Valley Road/Higuera St.	Signal	12	B
13) Higuera St./Tank Farm Rd.	Signal	23	C
14) Higuera St./Prado Rd.	Signal	16	B
15) Prado Rd./U.S. Highway 101 NB Ramps	Stop Sign[1]	< 18 (21)	C (C)

[1] *Overall intersection delay is presented with delay for the worst movement in parentheses.*
Source: Fehr & Peers Associates, 2003.

k. Background/Baseline Freeway Ramp Junction Service Levels. The addition of background traffic volumes, as shown on Figure 4.10-4, was analyzed in terms of freeway ramp junction operation. Operations at each merge/diverge location is shown in Table 4.10-7.

All ramp junctions within the study are expected to operate at acceptable levels (LOS C) during the PM peak hour under Baseline Conditions.

Table 4.10-7 Baseline Freeway Ramp Junction Service Levels

Ramp Location	PM Peak Hour Conditions	
	Density	Merge/Diverge LOS
Southbound Ramps		
Madonna SB On	25.3	C
LOVR SB Off	25.5	C
LOVR SB On	26.5	C
Northbound Ramps		
LOVR NB Off	22.7	C
LOVR NB On	21.4	C
Prado NB Off	21.0	C
Prado NB On	25.0	C
Madonna NB Off	25.3	C

Notes: Operations calculated using Highway Capacity Software.
Source: Fehr & Peers Associates, Inc., 2003.

4.10.2 Impact Analysis

a. Methodology and Thresholds of Significance. Impacts resulting from the implementation of the proposed project were evaluated under baseline conditions and two future scenarios. The two future scenarios included: 1) 10-year Conditions with some near-term

development and transportation improvements, and 2) Buildout Conditions representing full buildout of the City's General Plan.

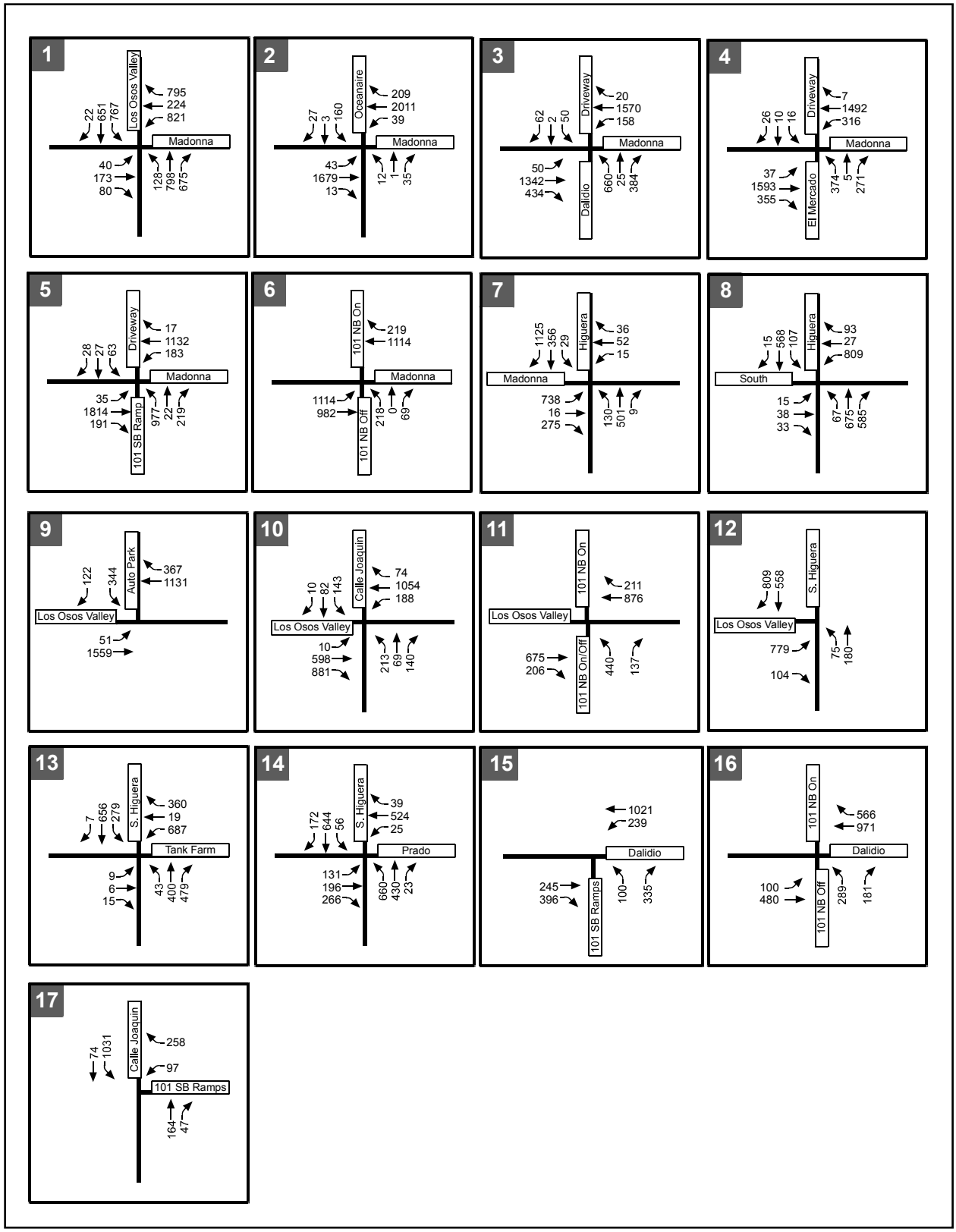
Background traffic projections were developed for the 10-year and buildout traffic scenarios without the proposed project. Per direction of City staff, both of these future "No Project" scenarios include the Prado Road interchange. Figures 4.10-8 and 4.10-9 show the resulting projections at each of the the study intersections. Figure 4.10-10 presents the freeway mainline and ramp volumes for 10-year and Buildout "No Project" Conditions. These projections were developed based on forecasts from the San Luis Obispo Citywide Traffic Model (SLOCTM). A full list of the planned roadway improvements and development projects contained in each of the future year traffic scenarios is included in Appendix F. One of the major improvements planned within the study area is the modification and upgrade of the U.S. 101/LOVR interchange for which a separate Project Study Report has been prepared. The intersection lane configurations and traffic control devices assumed for the new U.S. 101/Prado Road interchange and U.S. 101/LOVR interchange are illustrated on Figure 4.10-11.

In accordance with the State CEQA Guidelines, a project would result in a significant impact if it would:

- *Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);*
- *Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways;*
- *Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;*
- *Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);*
- *Result in inadequate emergency access;*
- *Result in inadequate parking capacity; or*
- *Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).*

The following thresholds were used to establish impact significance:

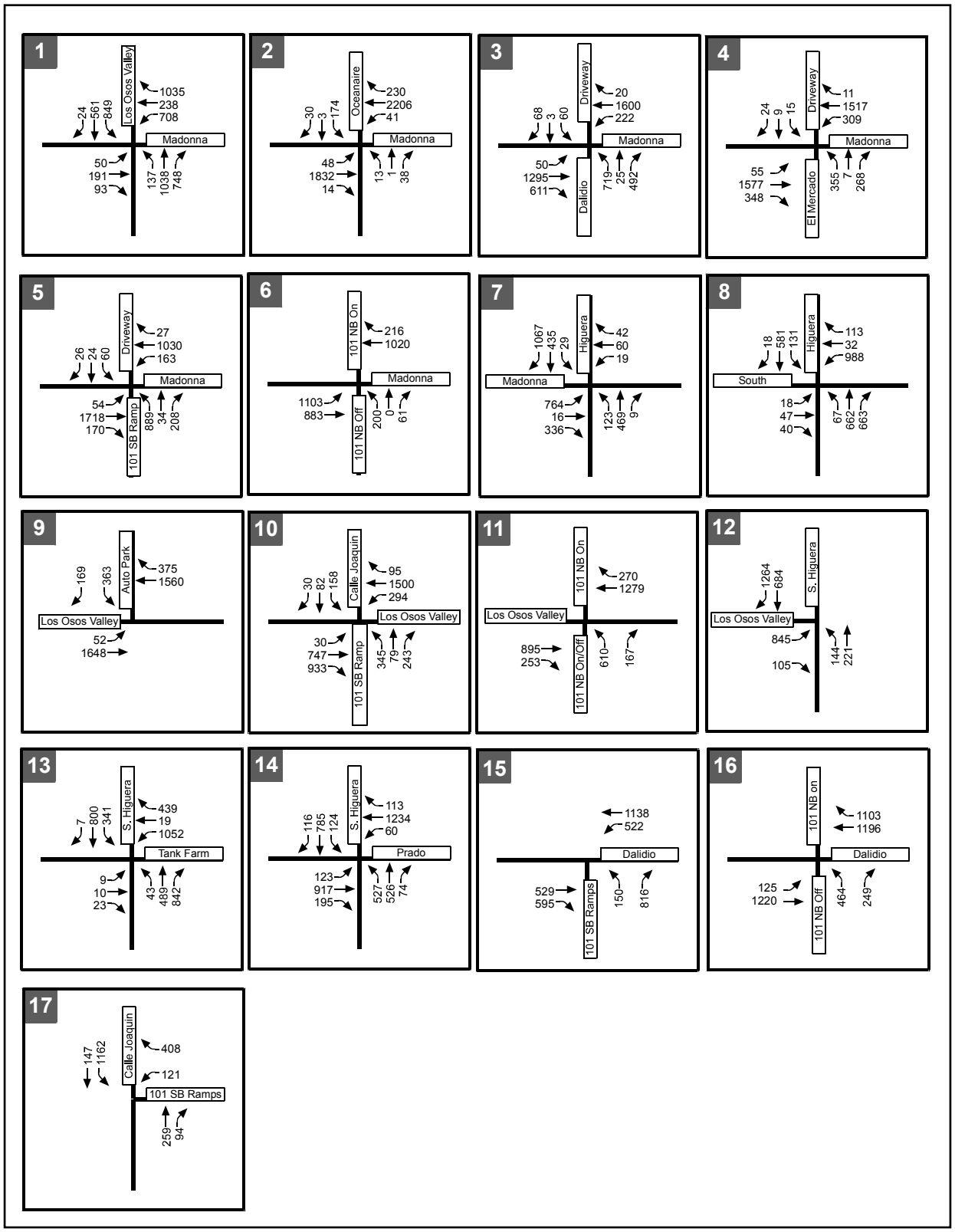
Intersection Impacts. An impact at an intersection is significant if project traffic causes the intersection's service level to change from LOS D or better to LOS E or F in the peak hour of operation. The City's General Plan Circulation Element identifies LOS D as the minimum acceptable service level on arterial streets outside of the City's downtown. For an intersection already operating at LOS E or F without the project, the addition of any project traffic to that location is considered a significant impact. A potentially significant impact is also identified for any intersection where projected queues would consistently extend out left-turn pockets and



Source: Fehr & Peers, Inc., November 2003

10-Year Volumes Without Project,
PM Peak-Hour Volumes

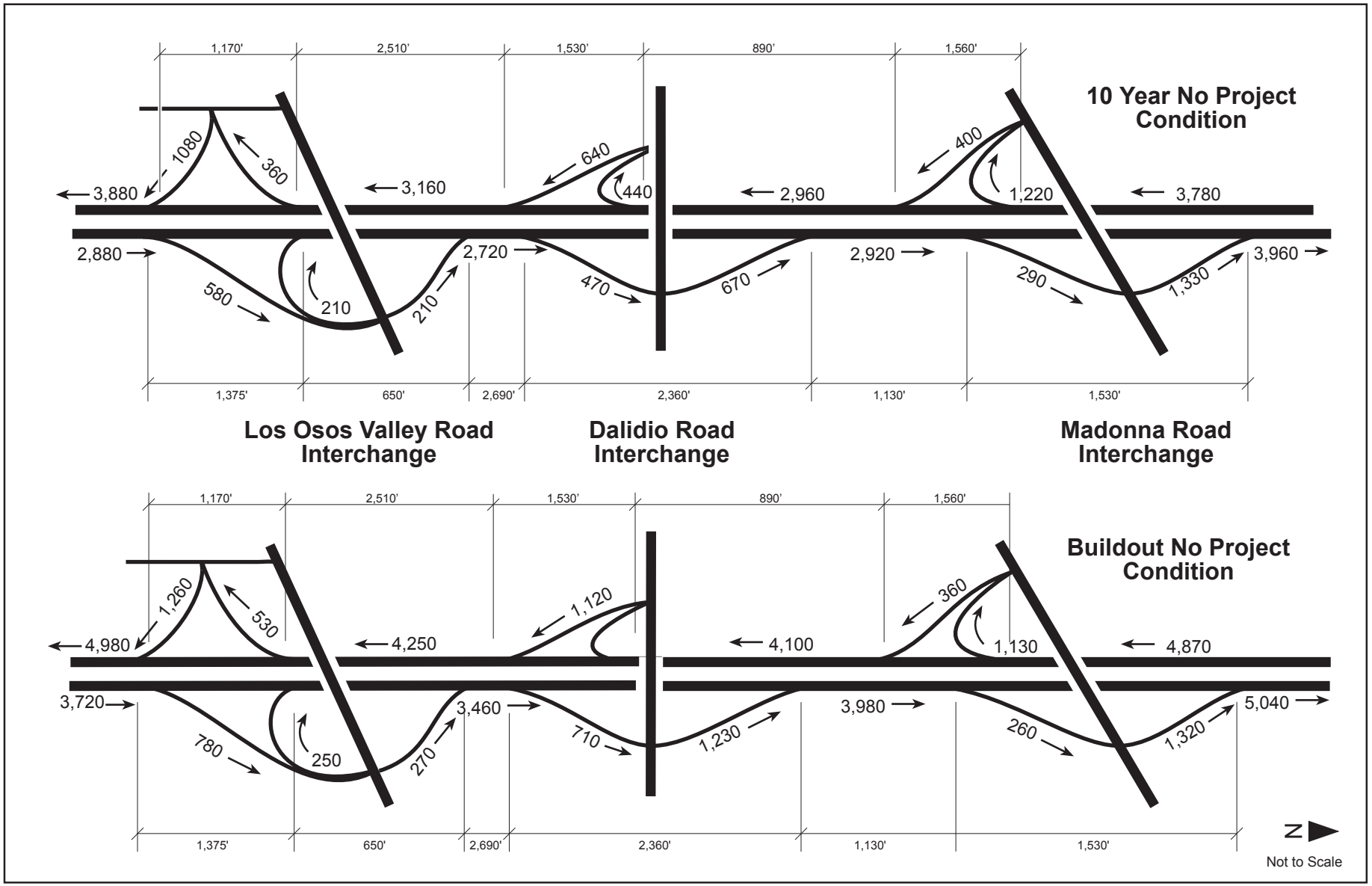
Figure 4.10-8



Source: Fehr & Peers, Inc., November 2003

Buildout Volumes Without Project,
PM Peak-Hour Volumes

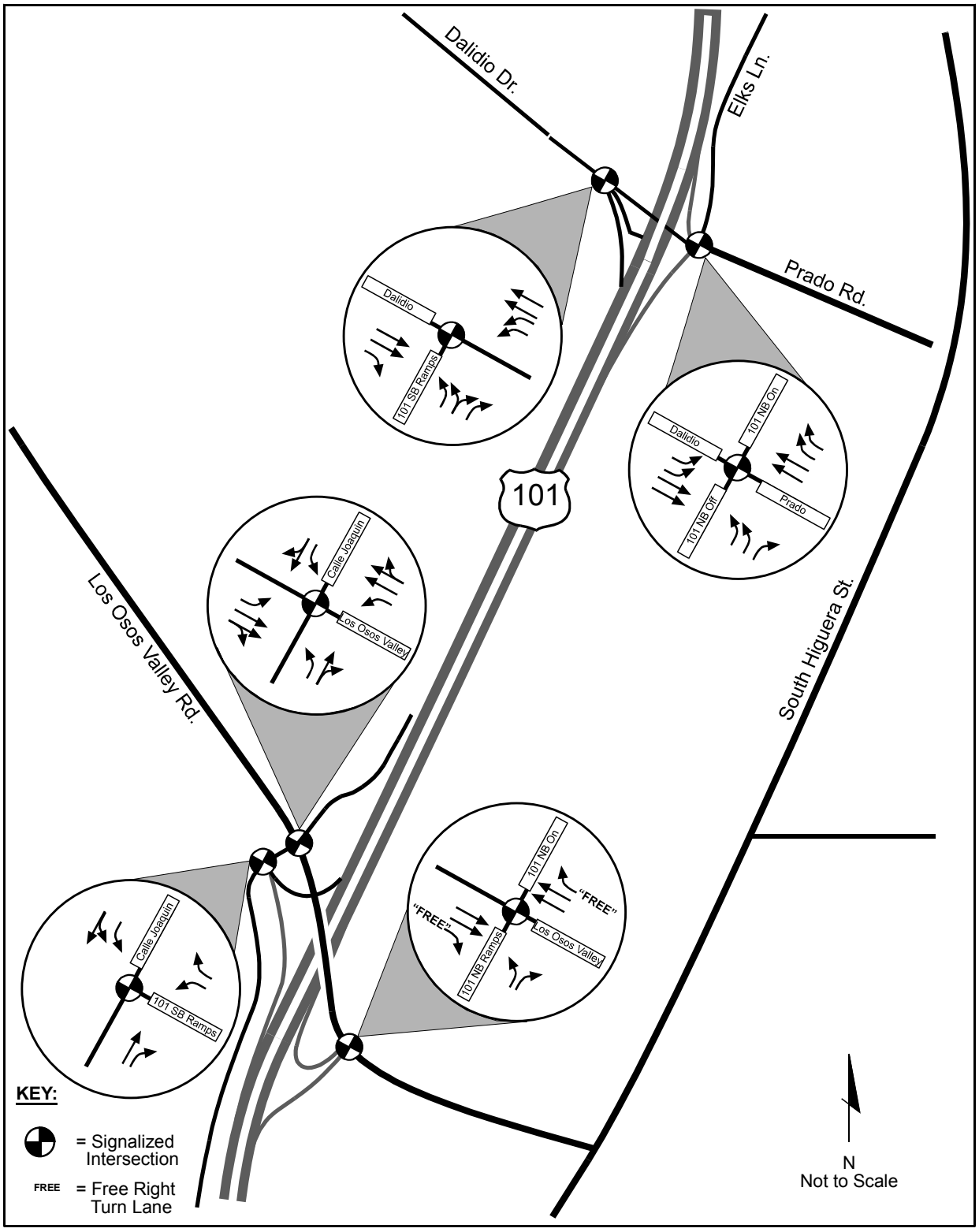
Figure 4.10-9



Source: Fehr & Peers, Inc., November 2003

Freeway and Ramp PM Peak-Hour Traffic Volumes
Under 10-Year No Project and Buildout No Project Conditions

Figure 4.10-10



Source: Fehr & Peers, Inc., November 2003

Initial Lane Configurations for U.S. 101/ Dalidio-Prado and U.S. 101/LOVR Interchanges

Figure 4.10-11

block through traffic. This situation could result in a safety impact and is deemed potentially significant.

Freeway Ramp Junction Impacts. The City of San Luis Obispo and the California Department of Transportation identify LOS D as the maximum acceptable service level for freeway and ramp junction facilities. A significant impact occurs if a project causes a facility to change from LOS D or better to LOS E or F. As with intersections and roadway segments, the addition of any project traffic to a ramp or mainline segment already operating at LOS E or F is considered a significant impact.

Pedestrian and Bicycle Impacts. An impact to pedestrians and bicycles is significant if a project adds traffic to any study roadway or intersection where there is pedestrian and bicycle demand, but appropriate pedestrian or bicycle facilities such as sidewalks, crosswalks, traffic signals, or bike lanes are not provided. Additionally, an impact is significant if a project creates pedestrian and bicycle demand without providing adequate and appropriate facilities for safe non-motorized mobility.

Transit Impacts. An impact to transit is significant if a project causes substantial congestion and increases vehicle delay on roadways (related to Intersection Impacts) that would require a change in the bus headways to maintain adequate service. Additionally, an impact is significant if a project generates potential transit trips and does not provide adequate facilities for pedestrians and bicyclists to access transit routes and stops to the extent feasible.

Neighborhood Impacts. A significant impact to residential neighborhoods occurs if the addition of project traffic causes the maximum desired ADT for local residential and residential collector streets to be exceeded, or if a project is designed in such a way as to potentially add substantial cut-through traffic to an existing neighborhood. Additionally, a project can significantly impact a neighborhood if it creates substantial delay elsewhere causing diversion of traffic through a neighborhood.

Emergency Access Impacts. An impact is significant if a project does not provide adequate emergency vehicle access to the site at a minimum of two locations, or provides a circulation system with features that could be detrimental to emergency vehicle response time.

b. Project Impacts and Mitigation Measures.

Impact T-1 Addition of traffic generated by the proposed project to Baseline traffic volumes would cause three study intersections to operate at unacceptable levels during the PM peak hour. This would result in a Class I, *significant and unavoidable,* impact under Baseline Plus Project Conditions.

The Baseline Plus Project analysis was conducted to determine the level of roadway improvements required to accommodate project traffic with the existing roadway network plus the new U.S. Highway 101/Prado Road interchange. The new interchange is part of the proposed project and construction of the commercial portion of the project cannot begin until the design has been approved for the planned Prado Road interchange, the contract has been awarded, and funding has been secured according to the City Community Development Department. Given these requirements and the fact that the interchange is part of the proposed

project, the interchange would be in place once the proposed project is fully occupied and represents a realistic scenario under near-term conditions.

The estimated amount of traffic generated by the proposed project is presented below.

Project Trip Generation. Traffic generated by the proposed project was estimated using shopping center, hotel, and general office trip rates from *Trip Generation (*6th Edition, 1997) published by the Institute of Transportation Engineers (ITE). The retail component's trip generation also accounted for pass-by trips. Pass-by trips are trips to the site made by vehicles already traveling by the site on the adjacent street (i.e., these vehicles make an interim stop between their primary origin and destination). Pass-by trips are included in the analysis of traffic that enters and exits the project site, but are not considered "new" trips added to the street system by the project. For this analysis, a 20% pass-by trip reduction was applied based on pass-by surveys conducted by ITE.

Standard rates were used to estimate traffic for the proposed hotel and office uses. Due to the proximity of these uses to the project's retail uses and the proposed internal connections, as well as the proximity of additional retail and dining opportunities at SLO Promenade, a 5% reduction was applied to both the hotel and office uses trip generation to reflect internal walk trips. An equivalent reduction was applied to the retail trip generation.

Table 4.10-8 summarizes the estimated trip generation of the proposed project. The proposed project would generate a total of 2,054 net new PM peak hour trips and 20,956 net new daily trips.

Table 4.10-8 Estimated Trip Generation of the Proposed Project

			Trip Rates1				Number of Trips			
Land Use Component	**Size**	**Units**	**Daily**	**In**	**Out**	**Total**	**Daily**	**In**	**Out**	**Total**
Shopping Center Retail[1]	635	ksf	35.23	1.61	1.74	3.35	22,379	1,021	1,106	2,127
Less pass-by (20%)							(4,476)	(213)	(213)	(426)
Less internalization from uses below							(170)	(5)	(15)	(20)
Retail Subtotal (A)							*17,723*	*803*	*878*	*1,681*
Hotel	130	rooms	8.92	0.35	0.36	0.71	1,160	45	47	92
Less internalization (5%)							(58)	(2)	(3)	(5)
Hotel Subtotal (B)							*1,102*	*43*	*44*	*87*
Office	198	ksf	11.33	0.26	1.26	1.52	2,243	51	250	301
Less internalization (5%)							(112)	(3)	(12)	(15)
Office Subtotal (C)							*2,131*	*48*	*238*	*286*
Grand Total (A + B +C)							**20,956**	**894**	**1,160**	**2,054**

[1] *PM peak hour trip generation is based on the Institute of Transportation Engineers (ITE) shopping center trip generation equation.*

Source: Fehr & Peers Associates, Inc., 2003.

Project Trip Distribution and Assignment. PM peak hour traffic volumes with the proposed project and the interchange were developed based on forecasts using the base year SLOCTM. The traffic model was used for this scenario to provide a more accurate estimate of changes to overall traffic patterns with a new interchange on U.S. 101, which is a regional facility. The estimated directions of approach and departure for the proposed project based on the existing roadway network are illustrated on Figure 4.10-12. The resulting Baseline Plus Project volumes are shown on Figure 4.10-13 and were used to calculate intersection levels of

service under this scenario. The intersection LOS results for this scenario are presented in Table 4.10-9.

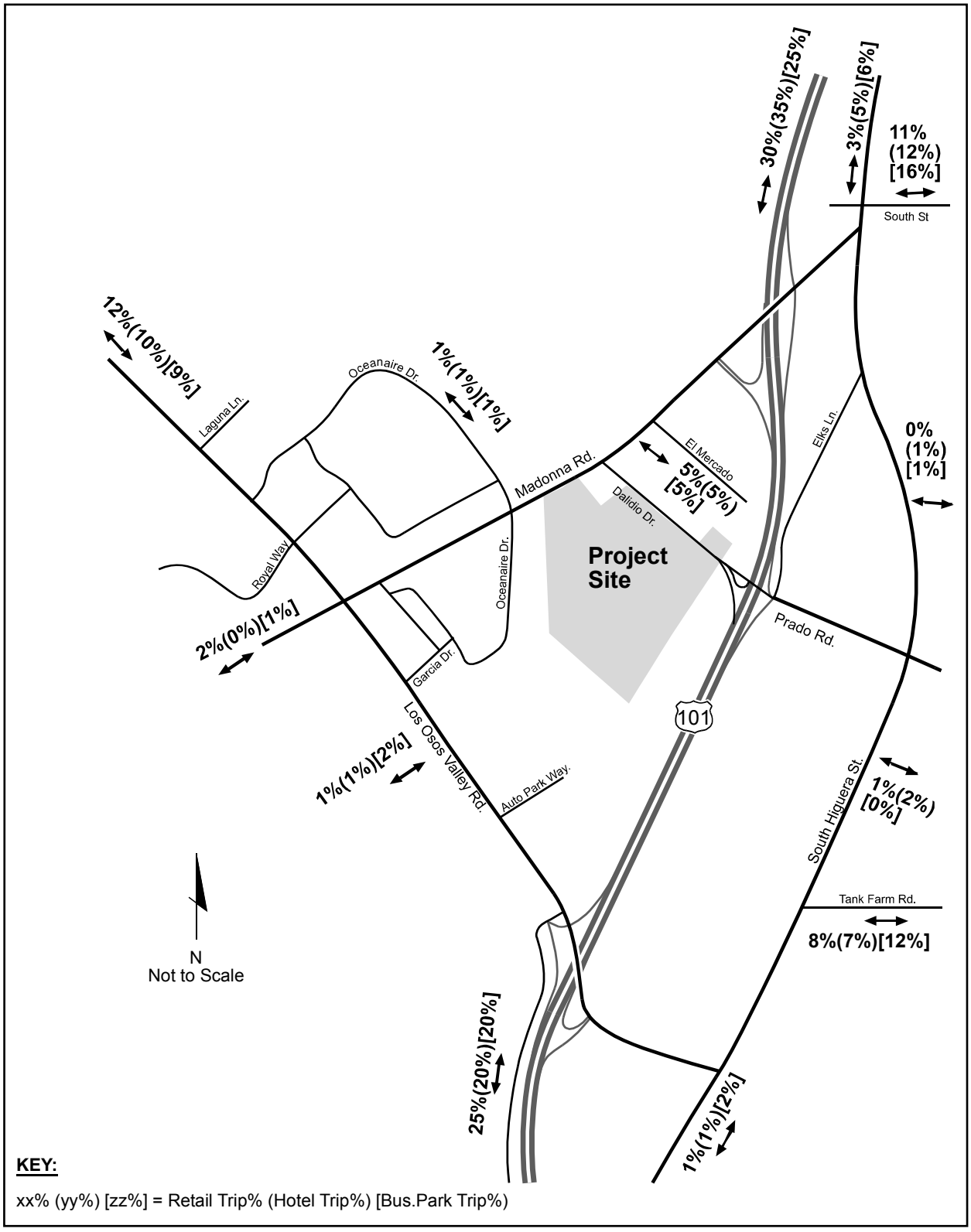
The planned extension of Dalidio Road and the construction of the U.S. 101/Prado Road interchange would divert some traffic from the Madonna Road interchange and, to a much lesser extent, the U.S. 101/LOVR interchange. Traffic would shift from through movements on LOVR to two already heavy movements: southbound left-turn on LOVR and the westbound right-turn on Madonna Road. This would increase delays at this intersection and contribute to unacceptable operations. This diversion would improve operations at several of the study intersections as shown in Table 4.10-9, even with the addition of project-generated traffic volumes. Although a substantial number of project-generated trips would access the site via the U.S. 101/Prado Road interchange, some trips from the north and west would access the site via the Madonna Road/Dalidio Drive intersection.

Table 4.10-9 Baseline Plus Project Intersection Levels of Service

		Baseline		Baseline Plus Project	
Intersection	Traffic Control	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS
1) Madonna Rd./Los Osos Valley Rd.	Signal	52	D	**91**	**F**
2) Madonna Rd./Oceanaire Dr.	Signal	11	B	13	B
3) Madonna Rd./Dalidio Dr.	Signal	30	C	46	D
4) Madonna Rd./El Mercado	Signal	21	C	20	C
5) Madonna Rd. / 101 Southbound Ramps	Signal	36	D	31	C
6) Madonna Rd. / 101 Northbound Ramps	Signal	33	C	29	C
7) Madonna Rd./Higuera St.	Signal	20	C	20	C
8) South St./Higuera St.	Signal	18	B	20	C
9) Los Osos Valley Road/Auto Park Way	Stop Sign[1]	**25 (> 60)**	**D (F)**	**25 (> 60)**	**D (F)**
10) Los Osos Valley Road/101 Southbound Ramps	Signal	67	E	53	D
11) Los Osos Valley Road/101 Northbound Ramps	Signal	40	D	34	C
12) Los Osos Valley Road/Higuera St.	Signal	12	B	10	A
13) Higuera St./Tank Farm Rd.	Signal	23	C	46	D
14) Higuera St./Prado Rd.	Signal	16	B	**66**	**E**
15) Prado Rd. / U.S. 101 NB Ramps	Signal[2]	18 (21)	C (C)	17	B
16) Prado Rd./U.S. 101 SB Ramps	Signal	N/A	N/A	17	B

[1] Worst-case delay and level of service is listed in parentheses for unsignalized intersections.
[2] Intersection would be modified and signalized as part of interchange reconstruction. Baseline delay and LOS is for unsignalized condition.
Source: Fehr & Peers Associates, 2003.

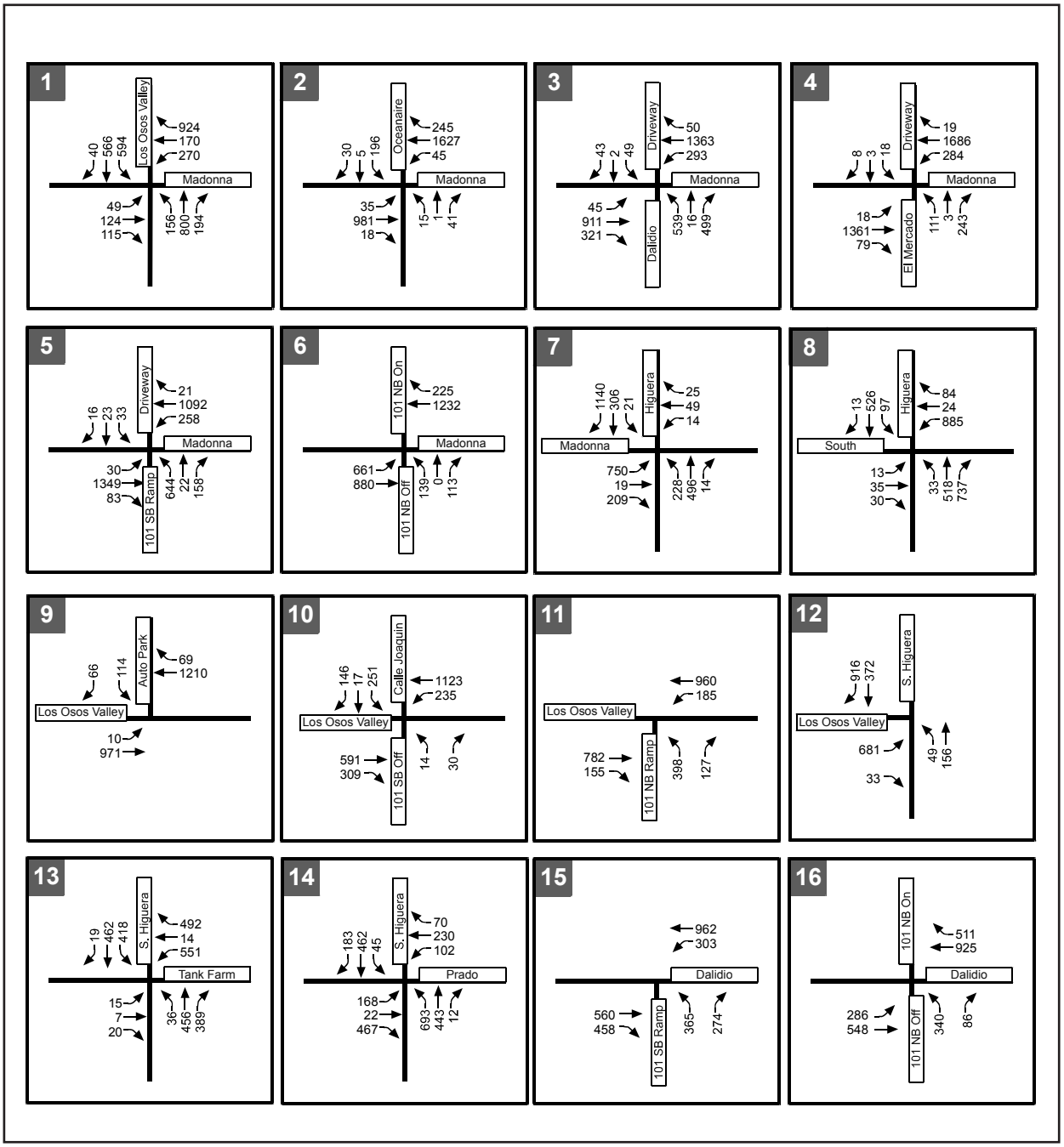
All but three of the intersections are projected to operate at LOS D or better during the PM peak hour with implementation of the proposed project that includes the new Prado Road interchange. The addition of project and interchange traffic would exacerbate unacceptable operations at the Madonna Road/LOVR intersection. The intersection of LOVR/Auto Park Way would continue to operate at LOS D, but delay to the side street may increase or decrease depending on vehicles redistributed to Prado Road from LOVR. Implementation of the project would degrade operations at the Higuera Street/Prado Road intersection from an acceptable (LOS B) to an unacceptable level (LOS E) during the PM peak hour. Therefore, the proposed project would have a significant impact on intersection operations in the study area.



Source: Fehr & Peers, Inc., November 2003

Project Trip Distribution,
No Prado Road Extension to Broad Street

Figure 4.10-12



Source: Fehr & Peers, Inc., November 2003

Baseline Plus Project PM
Peak-Hour Volumes

Figure 4.10-13

Mitigation Measures. Mitigation Measure AQ-4(b), in Section 4.3, *Air Quality,* would reduce overall project trip generation and would consequently reduce projected intersection impacts. The following additional measures would be required to reduce intersection operation impacts under Baseline Plus Project Conditions.

T-1(a) To mitigate significant impacts to the Madonna Road/LOVR intersection resulting in improved LOS F operation (with a delay of 46 seconds/vehicle), the project shall construct the following improvements:

- *provide a westbound right-turn overlap traffic signal phase*
- *prohibit southbound and westbound U-turn movements;*
- *make appropriate modifications to signal heads, poles, controller settings, signing and striping, and bike lanes as necessary to implement mitigation.*

T-1(b) To mitigate significant queuing on the northbound approach (Dalidio Drive) at the Madonna Road/Dalidio Drive intersection resulting in LOS C operation (with a delay of 34 seconds/vehicle), the project shall construct the following improvements:

- *install right-turn overlap phasing on the northbound Dalidio Drive approach (which would prohibit westbound U-turns);*
- *add a second northbound left-turn lane on Dalidio Drive;*
- *change the permitted phasing on Dalidio Drive to split phasing northbound and southbound*
- *construct second southbound lane on Dalidio Drive between Madonna Road and project boundary which would eliminate on-street parking.*
- *establish bicycle lanes on Dalidio Drive which would require up to an additional 10 feet of right-of-way to accommodate five-travel lane section (2 southbound receiving lanes, one northbound left-turn, one northbound shared left-turn/through, and one northbound right-turn lane) and bicycle lanes in both directions.*

T-1(c) To mitigate significant impacts to the Prado Road/Higuera Street intersection resulting in LOS C operation (30 seconds of delay/vehicle), the project shall fund the following improvement prior to 50% occupancy of the total project:

- *Reconstruct curb gutter and sidewalk (including utility undegrounding) in order to add a second northbound left-turn lane on Higuera Street, which may require lead/lag phasing with the southbound left-turn movement. Implementation of this measure will require right-of-way acquisition on the northwest corner of the intersection.*

  A review of the volumes under Baseline No Project Conditions indicate that the San Luis Obispo Creek bridge would not need to be widened to accommodate the projected volumes. The proposed project would increase the number of northbound left-turn vehicles to approximately 700 vehicles. Due to the wide receiving lane on Prado Road between the San Luis Obispo Creek bridge and Higuera Street,

it is possible to construct two receiving lanes to accommodate the proposed dual northbound left-turn lanes. However, due to the relatively short distance (approximately 200 to 250 feet) between the bridge and Higuera Street, vehicles will have to merge into one lane, which would limit the effectiveness of the two receiving lanes. Therefore, it is also recommended that the San Luis Obispo Creek bridge be widened to accommodate four lanes in conjunction with the dual northbound left-turn lanes at the Prado Road/Higuera Street intersection.

Significance After Mitigation. With implementation of the identified mitigation measures, impacts to intersection operations would be reduced to the extent feasible. However, operations at the intersection of Madonna Road/LOVR would remain at an unacceptable LOS F under post-project conditions. No feasible mitigation measures are available to reduce this impact to an acceptable level. Therefore, impacts would remain Class I, *significant and unavoidable.* The widening of San Luis Obispo Creek bridge, as required in Mitigation Measure T-1(c), could encroach into riparian habitat associated with the creek. Potential biological resources impacts and mitigation measures associated with such improvements are described in Impact BIO-3, in Section 4.5, *Biological Resources.*

Impact T-2 Traffic generated by the proposed project would increase the volumes on some freeway ramps within the study area; however, all of the freeway ramps are projected to operate at an acceptable level under Baseline Plus Project Conditions. This is considered a Class III, *less than significant* impact.

The freeway ramp junction analysis for Baseline Conditions with and without the proposed project is presented in Table 4.10-10. Baseline Plus Project freeway mainline and ramp volumes are shown on Figure 4.10-14. An analysis of potential weaving sections shows that none of the segments would allow weaving (i.e., the distance between adjacent ramps is too long, and/or the ramp volumes are too low). Table 4.10-11 presents the results of the weaving analysis.

Table 4.10-10 Baseline Plus Project Freeway Ramp Junction PM Peak Hour Service Levels

Ramp Location	Baseline (No Project) \Conditions		Baseline Plus Project Conditions	
	Density	Merge/Diverge LOS	Density	Merge/Diverge LOS
Southbound Ramps				
Madonna SB On	25.3	C	27.7	C
Dalidio SB Off	N/A	N/A	28.0	D
Dalidio SB On	N/A	N/A	28.4	D
LOVR SB Off	25.5	C	29.1	D
LOVR SB On	26.5	C	29.6	D
Northbound Ramps				
LOVR NB Off	22.7	C	24.0	C
LOVR NB On	21.4	C	22.5	C
Dalidio NB Off	21.0	C	22.3	C
Dalidio NB On	25.0	C	25.2	C
Madonna NB Off	25.3	C	25.6	C

Notes: Operations calculated using Highway Capacity Software.
Source: Fehr & Peers Associates, Inc., 2003.

Construction of the planned interchange modification at Prado Road includes auxiliary lanes between the Prado Road and Madonna Road interchanges as part of the project. Given the proximity of the adjacent on- and off-ramps, these lanes will provide additional capacity and help to minimize congestion.

Table 4.10-11 Weaving Service Levels
Baseline Plus Project PM Peak Hour Conditions

	Baseline Conditions		Baseline Plus Project Conditions	
Weave Section	LOS	Additional Capacity Required?	LOS	Additional Capacity Required?
Southbound				
Madonna – Dalidio	N/A	N/A	D	No
Northbound				
Dalidio - Madonna	N/A	N/A	C	No

Note: Service levels based on nomographs published in Caltrans Highway Design Manual.
Source: Fehr & Peers Associates, Inc., 2003.

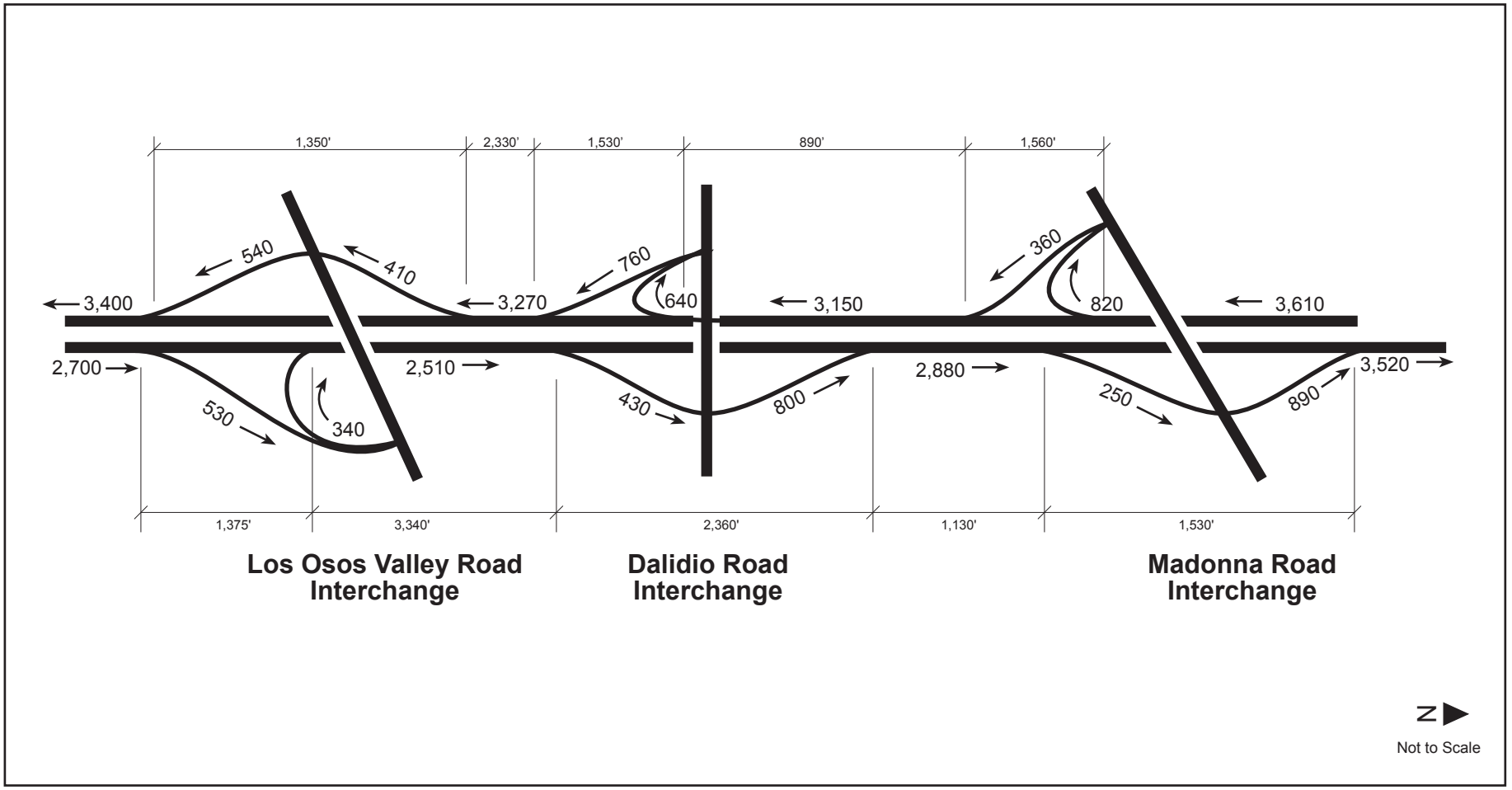
The addition of project-generated traffic, including the changes in traffic patterns caused by the new Prado Road interchange, would increase volumes on some freeway ramps. However, all ramps would continue to operate at LOS D or better during the PM peak hour. Also, the improved access to U.S. 101 would better distribute traffic within the study area. Thus, the impact of increased ramp volumes is considered less than significant under this scenario.

Mitigation Measures. No mitigation measures would be required.

Significance After Mitigation. Impacts to ramp operations would be less than significant.

Sensitivity Analysis. City staff requested that a sensitivity analysis be conducted to determine how much of the retail portion of the shopping center could be built without requiring any physical roadway improvements including the proposed Prado Road interchange. As noted above, the impact criteria state that the addition of any project-generated traffic to an intersection operating unacceptably is considered significant and would require mitigation. Development is limited by the operation of the Madonna Road/LOVR intersection, which is projected to operate at LOS D with approximately 52 seconds of delay, where the LOS D/E threshold is 55 seconds. Approximately 100,000 square feet of the retail center could be developed before this intersection is projected to operate at LOS E.

Staff also requested that a second sensitivity analysis be conducted to determine the amount of development that could be accommodated by the existing roadway system plus the addition of the interchange only (i.e., without Mitigation Measures T-1(a) through (d) described earlier in this section. The results of this analysis indicated that the Madonna Road/LOVR intersection is projected to operate at LOS E without the addition of any project traffic. The proposed Prado Road interchange would cause additional vehicles to shift to Madonna Road, thus increasing the delay at the Madonna Road/LOVR intersection. Therefore, any additional development would require at least some of the project mitigation measures described above.



Source: Fehr & Peers, Inc., November 2003

Freeway and Ramp PM Peak-Hour Traffic Volumes
Under Baseline Plus Project Conditions

Figure 4.10-14

Impact T-3 The addition of traffic from the proposed project under 10-year Conditions would cause several study intersections to operate at unacceptable levels during the PM peak hour. This is considered a Class II, *significant but mitigable* impact.

PM peak hour operations at the study intersections were evaluated both with and without the proposed project under 10-year conditions. It should be noted that this scenario assumes completion of the U.S. 101/LOVR interchange modifications, which adds a new signalized intersection located west of LOVR on Calle Joaquin (Intersection #17). A traffic signal was assumed for the Auto Park Way/LOVR intersection per City direction. In addition, the cycle lengths at selected intersections were adjusted by 5 to 20 seconds under No Project 10-Year conditions to account for changes that the City would typically implement as background traffic volumes increased over a 10-year period. In all cases, the resulting new cycle lengths for the local intersections ranged between 90 and 120 seconds. The Caltrans intersections ranged between 90 and 140 seconds. However, the cycle lengths were not adjusted with the addition of project traffic unless specifically identified as part of a mitigation measure.

The section of Prado Road, east of U.S. 101 to South Higuera Street (including the creek bridge), is assumed to be widened to four lanes. The west approach at the Prado Road/Higuera Street intersection is assumed to provide one left-turn lane (with protected phasing, separate from the through movement phasing), two through lanes, and one right-turn lane. The east leg is assumed to provide one left-turn lane (with protected phasing, separate from the through movement phasing), one through lane, one shared through/right-turn lane, and two eastbound receiving lanes based on the existing curb-to-curb width of 60 feet. In addition, the extension of Prado Road to Broad Street as a 2-lane road is included in this scenario. With this extension, project traffic to the east of S. Higuera Street can travel on Prado Road instead of Tank Farm Road or South Street. Figure 4.10-15 presents the directions of approach and departure with the Prado Road extension.

The 10-Year intersection service levels without and with the project are summarized in Table 4.10-12 and the 10-Year plus project intersection volumes are presented in Figure 4.10-16.

Table 4.10-12 10-Year Intersection Service Levels

Intersection[1]		Without Project		With Project[3]	
		Avg. Delay (sec/veh)	LOS[2]	Avg. Delay (sec/veh)	LOS
1) Madonna Rd./Los Osos Valley Rd.	Signal	**> 160**	**F**	**> 200**	**F**
2) Madonna Rd./Oceanaire Dr.	Signal	14	B	18	D
3) Madonna Rd./Dalidio Dr.	Signal	59	E	**114**	**F**
4) Madonna Rd./El Mercado	Signal	20	C	21	C
5) Madonna Rd. / 101 Southbound Ramps	Signal	53	D	**65**	**E**
6) Madonna Rd. / 101 Northbound Ramps	Signal	50	D	**62**	**E**
7) Madonna Rd./Higuera St.	Signal	18	B	19	B
8) South St./Higuera St.	Signal	21	C	22	C
9) Los Osos Valley Road/Auto Park Way	Signal[1]	15	B	15	B
10) Los Osos Valley Road/Calle Joaquin	Signal	43	D	43	D
11) Los Osos Valley Road/101 NB Ramps	Signal	8	A	8	A
12) Los Osos Valley Road/Higuera St.	Signal	14	B	14	B
13) Higuera St./Tank Farm Rd.	Signal	21	C	23	C
14) Higuera St./Prado Rd.	Signal	59	E	71	E

Table 4.10-12 10-Year Intersection Service Levels

15) Prado Rd. / U.S. 101 NB Ramps	Signal[1]	16	B	21	C
16) Prado Rd./U.S. 101 SB Ramps	Signal	14	B	14	B
17) Calle Joaquin/U.S. 101 SB Ramps	Signal	14	B	14	B

[1] *All intersections are assumed to be signalized.*
[2] *LOS = Level of service.*
[3] *No mitigation included.*
Source: Fehr & Peers Associates, Inc., 2003.

Under 10-year conditions without the project, the proposed project is expected to exacerbate unacceptable (LOS E or F) operations at three locations:

- Madonna Road/LOVR
- Madonna Road/Dalidio Drive
- Higuera Street/Prado Road

The addition of project traffic is expected to degrade operations from LOS D to LOS E at the following two intersections on Madonna Road:

- Madonna Road/US 101 Northbound Ramps
- Madonna Road/US 101 Southbound Ramps

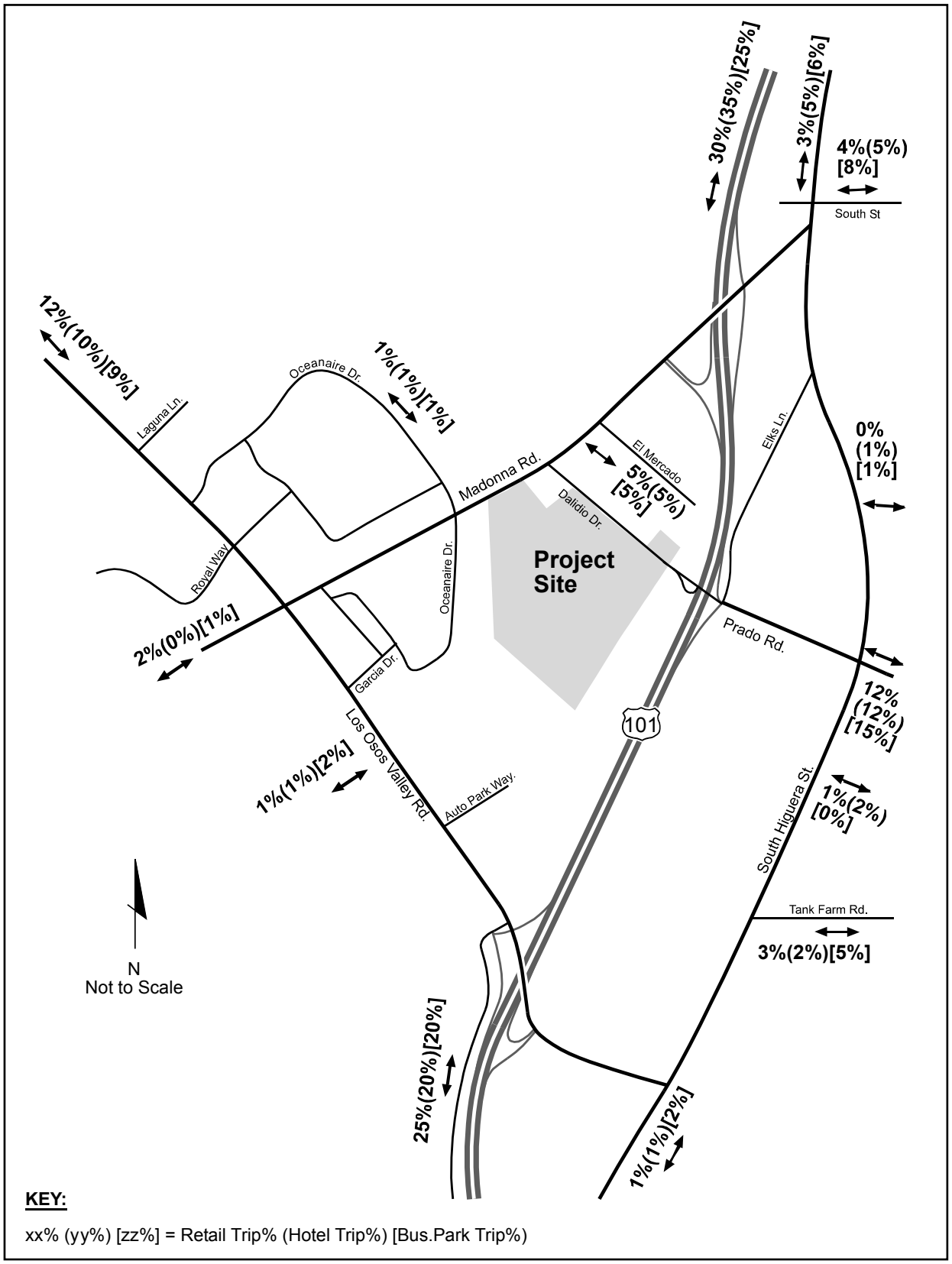
Traffic originating from or destined for the northeast is expected to increase delays at these intersections, which have delays that are close to the LOS D/E threshold without the project. In the case of the Madonna Road/US 101 Northbound ramps, part of the reason for the unacceptable operation is the inclusion of the protected north-south pedestrian phase (across the east leg of the intersection) during the eastbound left-turn phase. This precludes eastbound through traffic from proceeding simultaneously with the left-turning vehicles and increases delay. This intersection is addressed separately under Impact T-5. All other intersections are projected to operate at LOS D or better during the PM peak hour under this scenario.

These changes to intersection operations are considered significant impacts according to the impact criteria.

Mitigation Measures. Measure T-1(a) would reduce the delay at the Madonna Road/LOVR intersection to LOS F operations with 140 seconds of delay, which is less delay than expected under 10-year No Project Conditions (160 seconds). Mitigation T-1(c) would reduce the delay at the Higuera Road/Prado Road intersection from 71 seconds (LOS E) to 38 seconds (LOS D). In addition to Mitigation Measures AQ-4(b) that require trip reduction measures, the following measures would be required to mitigate project impacts to intersection operation under the 10 Year Plus Project scenario. These improvements are illustrated on Figure 4.10-17.

T-3(a) To mitigate the projected impact to the Madonna Road/Dalidio Drive intersection (i.e., to maintain LOS D operations with 36 seconds of delay), the project shall construct the following intersection improvements in addition to Mitigation Measure T-1(b):

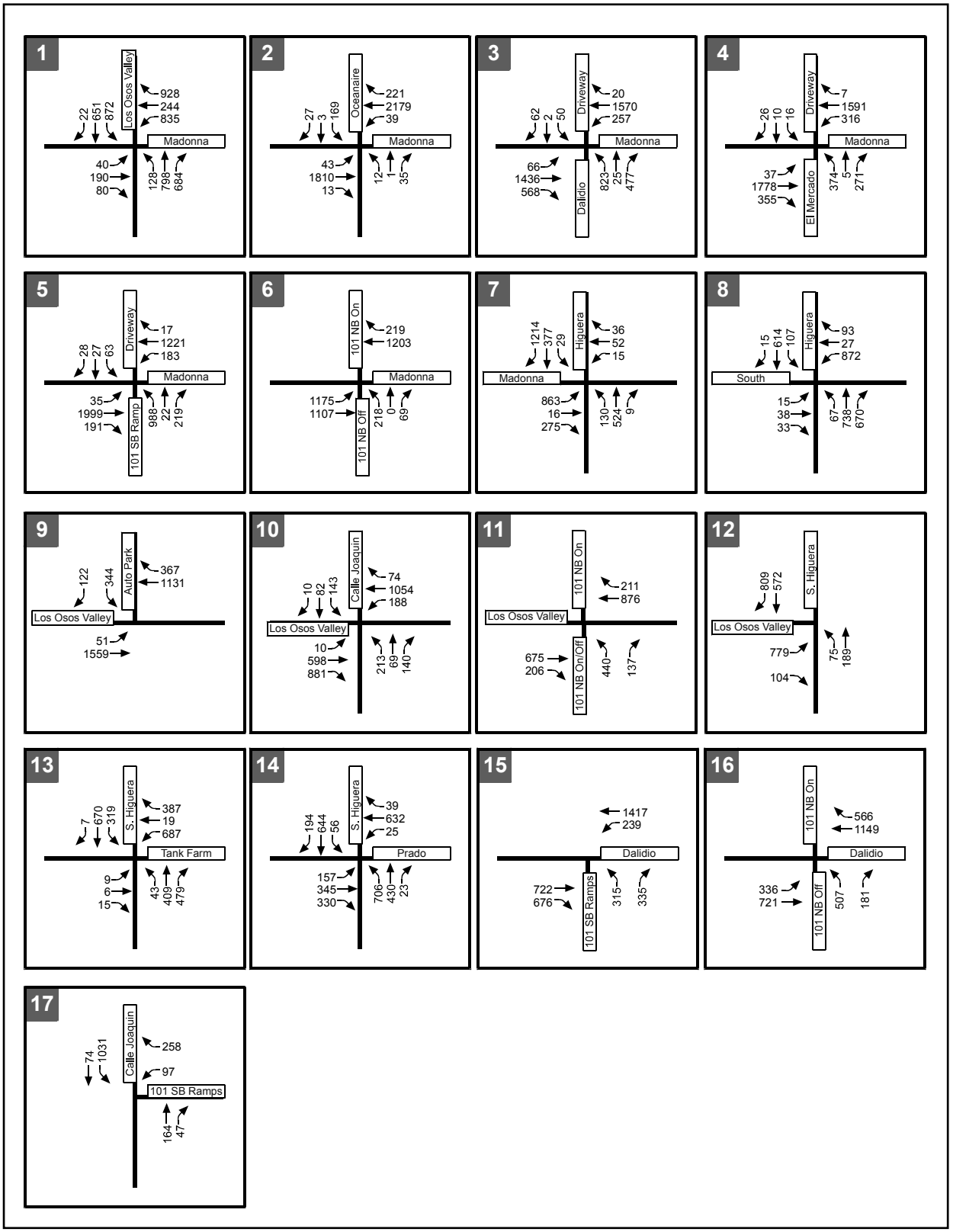
- *widen the eastbound approach (Madonna Road) to provide one left-turn lane, two through lanes, and one right-turn lane with overlap phasing (this would require prohibition of northbound U-turns from Dalidio Drive)*



Source: Fehr & Peers, Inc., November 2003

Project Trip Distribution,
With Prado Road Extension to Broad Street

Figure 4.10-15



Source: Fehr & Peers, Inc., November 2003

10-Year Volumes Plus Project,
PM Peak-Hour Volumes

Figure 4.10-16

T-3(b) To mitigate the projected impact to the Madonna Road/US 101 Southbound Ramps intersection the project should contribute it's fair share as calculated by the City to:

1. Install an additional third northbound left-turn lane on the off-ramp which will result in LOS D operation (with 43 seconds of delay). This improvement would require coordination with Caltrans and would require widening of the intersection. Design issues, such as horizontal curve alignment and encroachment into the drainage culvert, would need to be addressed with the widening: or,

2. Install an exclusive eastbound right-turn lane pocket which would reduce the delay to 51.3 seconds (LOS D). However, this alternative improvement would also encroach into the drainage culvert and impact the adjacent bicycle lane and sidewalk.

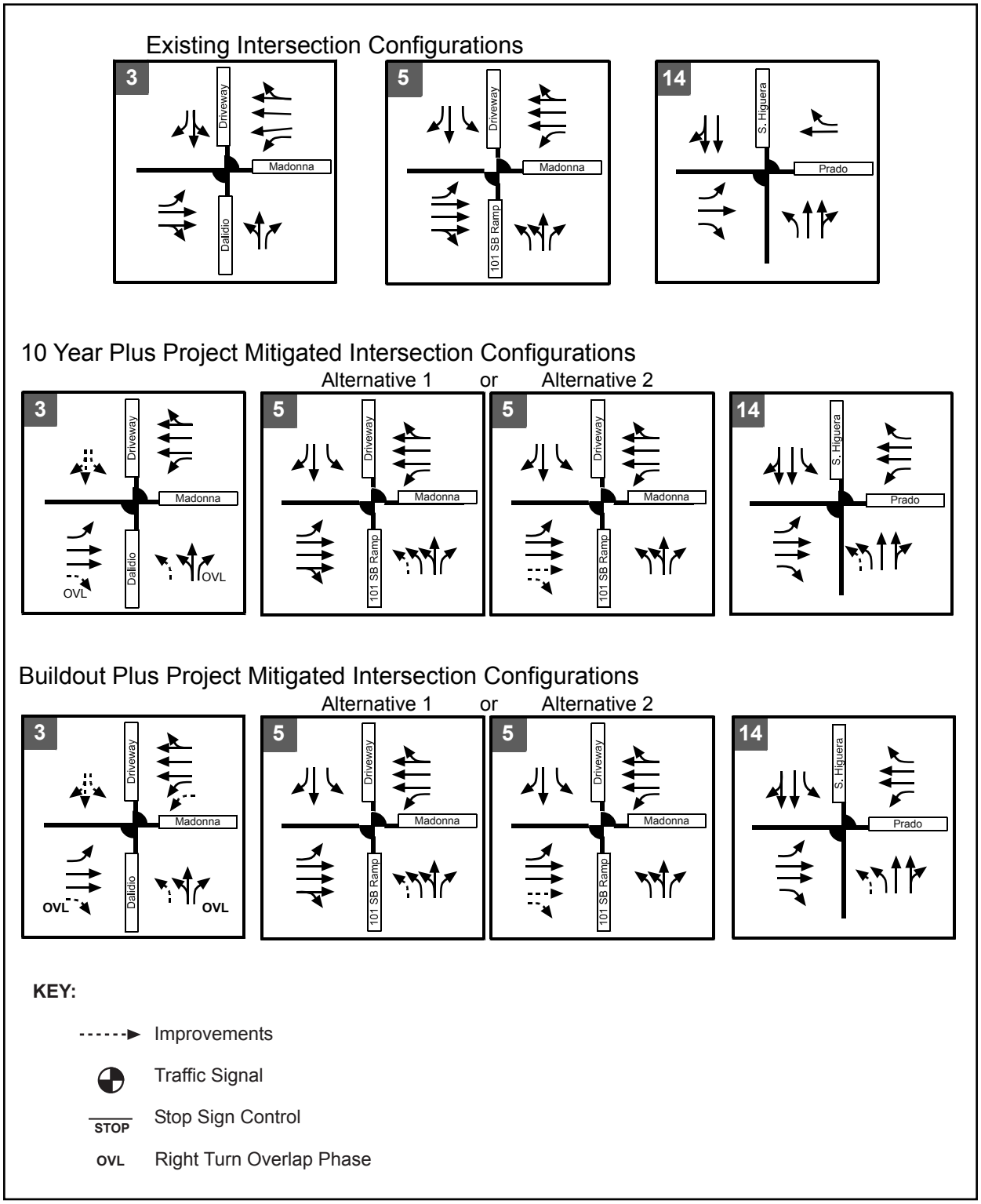
Significance After Mitigation. Implementation of the measures listed above would reduce project intersection impacts under the 10 Year Plus Project scenario to less than significant levels.

Impact T-4 The addition of traffic from the proposed project under 10-year Conditions would degrade operations at the Madonna Road/US 101 Northbound Ramps intersection from LOS D to E with 62 seconds of delay. This is considered a Class II, *significant but mitigable* impact.

Mitigation Measures. In addition to Mitigation Measure AQ-4(b) that require trip reduction measures, the following measure would be required to mitigate project impacts to intersection operations under the 10 Year Plus Project scenario. This improvements is illustrated on Figure 4.10-18.

T-4(a) Coordinate with Caltrans to include the pedestrian crossing movement with the northbound off-ramp phase in addition to the protected north-south pedestrian phase during the eastbound left-turn movement at the US 101/Madonna Road Northbound Ramps in order to improve operations for vehicles. This would require pedestrians to cross during the northbound off-ramp phase when pedestrian movement would not be protected (i.e., right-turning vehicles from the off-ramp would have to yield to pedestrians). However, this modification may include more pedestrian crossing time than is currently given to pedestrians. This phasing modification would result in LOS D operations (37 seconds of delay).

Significance After Mitigation. Implementation of the measure listed above would reduce the project intersection impact to a less than significant level.



Source: Fehr & Peers, Inc., November 2003

Intersection Mitigation: 10-Year and Buildout Plus Project Scenarios

Figure 4.10-17

Impact T-5 Traffic generated by the proposed project would potentially cause freeway ramp operations at Los Osos Valley Road On-Ramp to Southbound US 101 to degrade to unacceptable levels under 10-Year Plus Project conditions. This is considered a Class II, *significant but mitigable* impact.

The operations of the study freeway ramp junctions with and without the proposed project under the 10-year scenario are summarized in Table 4.10-13. Figure 4.10-19 presents 10-Year plus Project freeway mainline and ramp volumes. This analysis assumes that the proposed interchange includes auxiliary lanes between the Madonna Road and Prado Road interchanges in both directions. Therefore, the ramps between the interchanges were analyzed as weaving sections. Table 4.10-14 presents the results of the weaving analysis.

Table 4.10-13 10-Year Plus Project Freeway Ramp Junction PM Peak Hour Service Levels

Ramp Location	10-Year (No Project) Conditions		10-Year Plus Project Conditions	
	Density	Merge/Diverge LOS	Density	Merge/Diverge LOS
Southbound Ramps				
Dalidio SB On	27.6	C	29.6	D
LOVR SB Off	28.1	D	30.6	D
LOVR SB On	33.1	D	**35.4**	**E**
Northbound Ramps				
LOVR NB Off	25.6	C	27.6	C
LOVR NB On	24.3	C	26.1	C
Dalidio NB Off	24.2	C	26.1	C

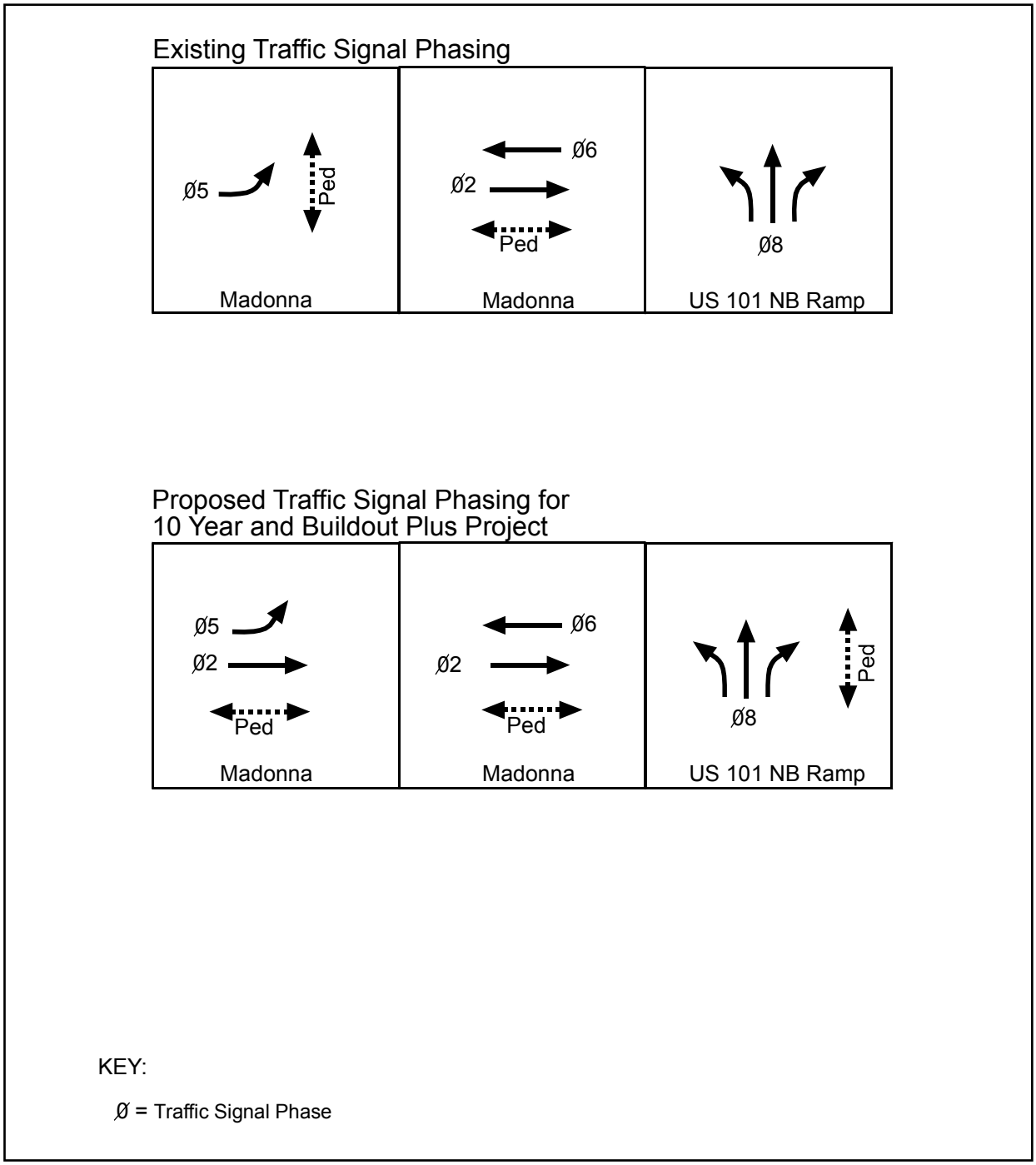
Notes: Operations calculated using Highway Capacity Software.
Source: Fehr & Peers Associates, Inc., 2003.

Table 4.10-14 Weaving Service Levels 10-Year Plus Project PM Peak Hour Conditions

Weave Section	10-Year Conditions		10-Year Plus Project Conditions	
	LOS	Additional Capacity Required?	LOS	Additional Capacity Required?
Southbound				
Madonna – Dalidio	C	No	D	No
Northbound				
Dailidio - Madonna	C	No	C	No

Note: Service levels based on nomographs published in Caltrans Highway Design Manual.
Source: Fehr & Peers Associates, Inc., 2003.

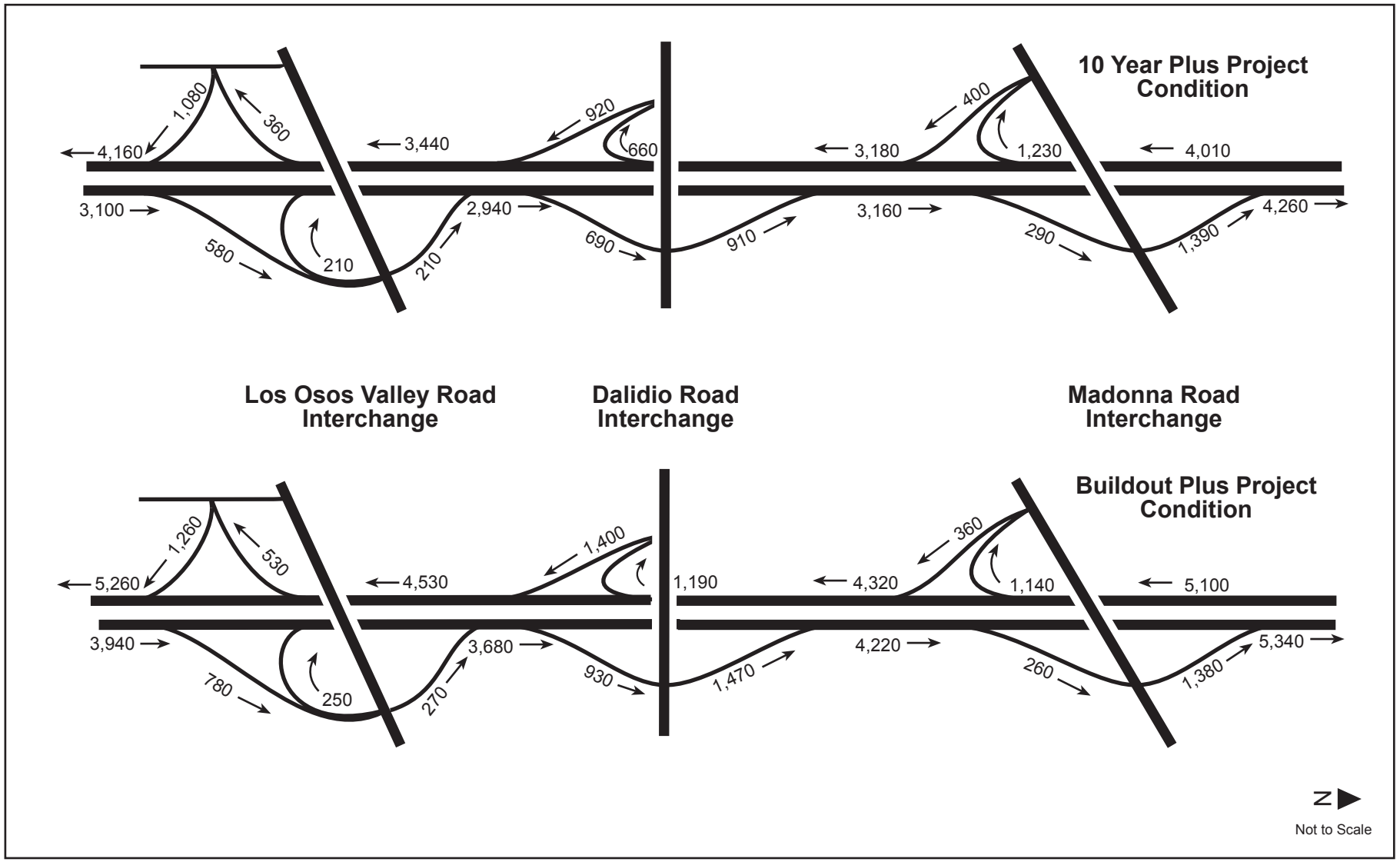
Ramp junctions on U.S. 101 within the study area are generally projected to operate acceptably under 10-year conditions without the proposed project. The addition of new ramps at Prado Road and the Dalidio Drive extension would re-distribute traffic at the Madonna Road and LOVR interchanges. Only the LOVR southbound on-ramp is projected to operate at an unacceptable level (LOS E) under this scenario indicating the need for a longer merge lane for the on-ramp. Although the project does not necessarily add a substantial volume to this ramp,



Source: Fehr & Peers, Inc., November 2003

U.S. 101 NB Ramp/Madonna Rd. Intersection
LOS Mitigation 10-Year and
Buildout Plus Project Scenarios

Figure 4.10-18



Source: Fehr & Peers, Inc., November 2003

Freeway and Ramp PM Peak-Hour Traffic Volumes
Under 10-Year Plus Project and
Buildout Plus Project Conditions

Figure 4.10-19

it will add traffic to the mainline freeway section, which affects ramp operations. The analysis of this segment indicates that the weaving sections in both directions between Madonna Road and Prado Road would operate at LOS D or better with the proposed auxiliary lanes.

Mitigation Measures. The following measure would be required to mitigate the projected ramp merge/diverge impacts at LOVR:

T-5(a) To mitigate impacts at the LOVR southbound on-ramp to US 101, the project applicant will pay Transportation Impact Fees (TIF), some of which will be applied to reconstruction of the LOVR interchange. The city will incorporate, via the City's TIF program, for the lengthening of the merging area for a total distance of 700 feet [measured from the gore point (i.e., the point where the right edge of the freeway shoulder and left edge of the merge lane meet) to the end of the merge area] in the ongoing design of the interchange.

Significance After Mitigation. With implementation of Mitigation Measure T-5(a), the projected impacts would be reduced to a less-than-significant level.

Buildout Conditions

Buildout PM peak hour operations at all of the study intersections were evaluated both with and without the proposed project. This scenario assumes the same improvements have been made as in the Project+10 Year scenario, and also that Prado Road will be extended from S. Higuera Street to Broad Street as a four-lane divided arterial, as per the City Circulation Element. The intersection service levels are summarized in Table 4.10-15. Buildout plus project intersection volumes are shown on Figure 4.10-20.

Impact T-6 **The addition of project-generated traffic would cause and contribute to several study area intersections operating at LOS E or F under Buildout Plus Project conditions. This is considered a Class II, *significant but mitigable* impact.**

Table 4.10-15 Buildout Intersection Service Levels

Intersection	Without Project		With Project[3]	
	Avg. Delay (sec/veh)	LOS[2]	Avg. Delay (sec/veh)	LOS
1) Madonna Rd./Los Osos Valley Rd.	**> 200**	F	**> 200**	**F**
2) Madonna Rd./Oceanaire Dr.	22	C	35	C
3) Madonna Rd./Dalidio Dr.	89	F	**150**	**F**
4) Madonna Rd./El Mercado	23	C	24	C
5) Madonna Rd. / 101 Southbound Ramps	43	D	49	D
6) Madonna Rd. / 101 Northbound Ramps	42	D	51	D
7) Madonna Rd./Higuera St.	19	B	20	C
8) South St./Higuera St.	23	C	24	C
9) Los Osos Valley Road/Auto Park Way[1]	33	C	33	C
10) Los Osos Valley Road/Calle Joaquin	61	E	**61**	**E**
11) Los Osos Valley Road/101 NB Ramps	14	B	14	B
12) Los Osos Valley Road/Higuera St.	32	C	34	C
13) Higuera St./Tank Farm Rd.	40	D	44	D
14) Higuera St./Prado Rd.	83	F	**104**	**F**

Table 4.10-15 Buildout Intersection Service Levels

Intersection	Without Project		With Project[3]	
	Avg. Delay (sec/veh)	LOS[2]	Avg. Delay (sec/veh)	LOS
15) Prado Rd. / U.S. 101 NB Ramps[1]	19	D	27	C
16) Prado Rd./U.S. 101 SB Ramps	31	C	28	C
17) Calle Joaquin/U.S. 101 SB Ramps	54	D	54	D

[1] *All intersections are assumed to be signalized.*
[2] *LOS = Level of service.*
[3] *No mitigation included.*
Source: Fehr & Peers Associates, Inc., 2003.

Because of the substantial growth in traffic at buildout of San Luis Obispo, four intersections are projected to operate at an unacceptable level regardless of project implementation. It should be noted that this scenario includes the Prado Road interchange but no development on the project site.

With the addition of site-generated traffic, the project is expected to result in significant impacts at the following three intersections:

- Madonna Road/LOVR
- Madonna Road/Dalidio Drive
- South Higuera Street/Prado Road

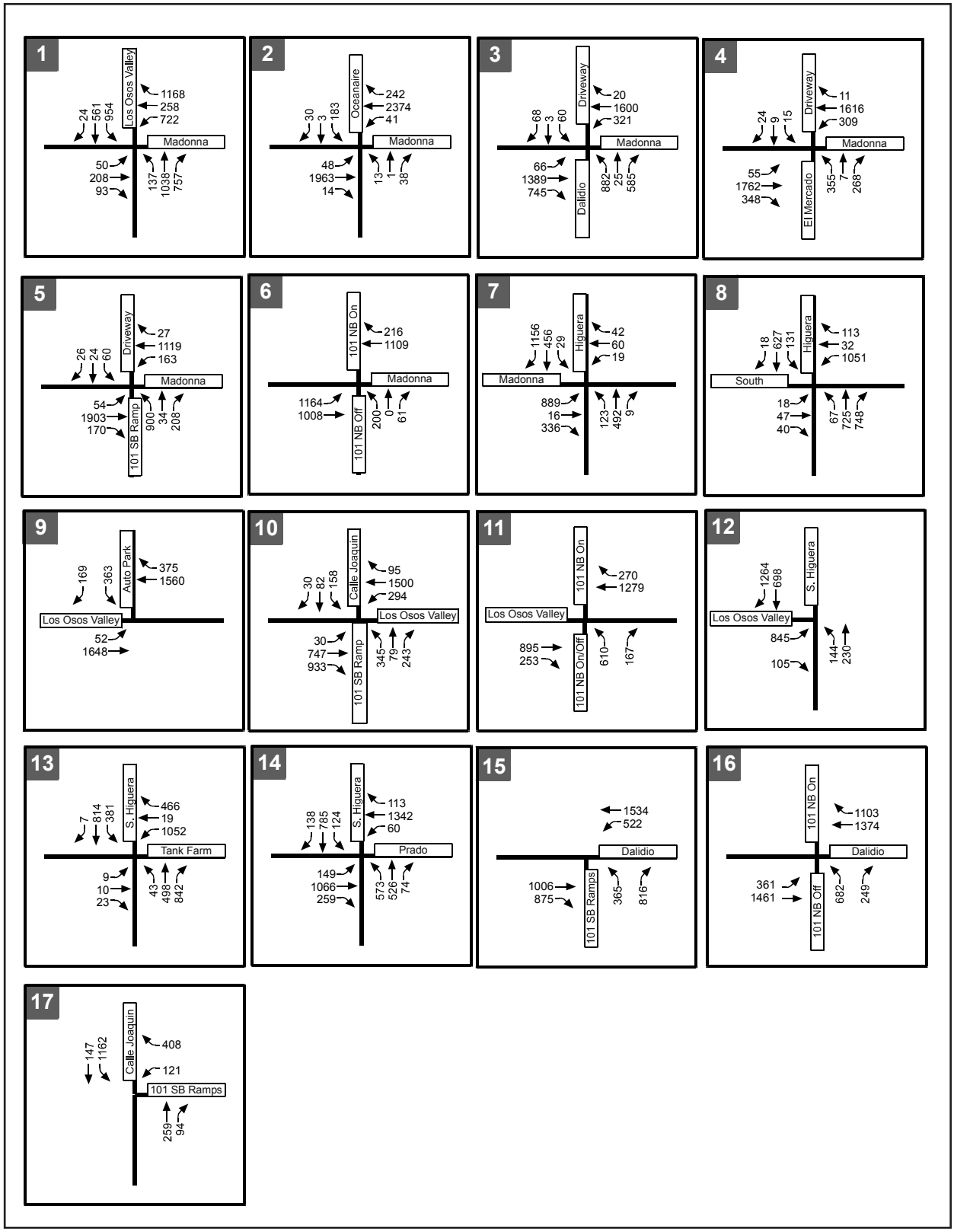
The addition of traffic from the proposed project would exacerbate future unacceptable operations at these three locations that will occur with other development and ambient traffic increases. As under 10-year conditions, the Madonna Road/LOVR intersection is expected to operate at LOS F due to cumulative traffic growth in addition to project-generated vehicular and pedestrian trips. Therefore, the project would have a potentially significant impact on intersection operations under the Buildout Plus Project scenario.

Mitigation Measures. Mitigation Measure T-1(a) would improve operations at the Madonna Road/LOVR intersection by reducing the projected delay to 180 seconds, which is less than under Buildout No Project Conditions (> 200 seconds). Mitigation T-3(b) would provide LOS D operations at the US 101 Southbound Ramps/Madonna Road intersection. Mitigation T-1(c) would reduce the delay at the Higuera Road/Prado Road intersection from 104 seconds (LOS F) to 78 seconds (LOS E). Mitigation Measure T-4(a) would reduce the delay at the US 101 Northbound Ramp/Madonna Road intersection to LOS D. In addition to these measures, the measure listed below (illustrated on Figure 4.10-17) would be required to mitigate impacts to intersection operations under the Buildout Plus Project scenario.

T-6(a) To mitigate significant impacts to the Madonna Road/Dalidio Drive intersection resulting in LOS D operation (delay 32 seconds/vehicle), the project shall construct the following improvement in addition to Mitigation Measures T-1(b) and T-3(a):

- *Add a second westbound left-turn lane on Madonna Road.*

Significance After Mitigation. Implementation of these measures would reduce impacts to intersection operations under the Buildout Plus Project scenario to a less than significant level.



Source: Fehr & Peers, Inc., November 2003

Buildout Volumes Plus Project
PM Peak-Hour Volumes

Figure 4.10-20

Table 4.10-16 shows a summary of the resulting intersection levels of service that would occur with implementation of the measures required for the Baseline Plus Project scenario. Table 4.10-17 shows a summary of the resulting intersection levels of service that would occur with implementation of the measures required for the 10-Year Plus Project and Buildout Plus Project scenarios.

Table 4.10-16 Summary of Intersection Levels of Service

	Baseline					
	No Project		Plus Project		Mitigated	
Intersection	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1) Madonna Rd./Los Osos Valley Rd.	52	D	**91**	**F**	46	D
2) Madonna Rd./Oceanaire Dr.	11	B	13	B		
3) Madonna Rd./Dalidio Dr.	30	C	46	D	34	C
4) Madonna Rd./El Mercado	21	C	20	C		
5) Madonna Rd. / 101 Southbound Ramps	36	D	31	C		
6) Madonna Rd. / 101 Northbound Ramps	33	C	29	C		
7) Madonna Rd./Higuera St.	20	C	20	C		
8) South St./Higuera St.	18	B	20	C		
9) Los Osos Valley Road/Auto Park Way	**25 (> 60)**	**D (F)**	**25 (>60)**	**D (F)**	7	A
10) Los Osos Valley Road/Calle Joaquin	67	E	53	D		
11) Los Osos Valley Road/101 NB Ramps	40	D	34	C		
12) Los Osos Valley Road/Higuera St.	12	B	10	A		
13) Higuera St./Tank Farm Rd.	23	C	46	D		
14) Higuera St./Prado Rd.	16	B	**68**	**E**	30	C
15) Prado Rd. / U.S. 101 NB Ramps	< 18 (21)	C (C)	17	B		
16) Prado Rd. / U.S. 101 SB Ramps	N/A	N/A	17	B		

Notes: (U) = Unsignalized intersection under existing conditions; Delay = Average stopped delay in seconds per vehicle at signalized intersections and average total delay in seconds per vehicle at unsignalized intersections; LOS = Level of Service. Worst case LOS for an individual movement or approach presented in parentheses; Unacceptable intersection operations in bold type.
Source: Fehr and Peers, Inc., 2003.

Impact T-7 **Project-generated traffic would be expected to exacerbate unacceptable operations at several of the ramp junctions on U.S. 101 and cause one location to degrade from LOS C to LOS E during the PM peak hour. Therefore, the proposed project would result in a Class I, *significant and unavoidable* impact to U.S. 101 operations under Buildout Plus Project conditions.**

Table 4.10-18 summarizes the projected operations of the U.S. 101 ramp junctions with and without the proposed project under buildout conditions.

All of the southbound ramp merge/diverge locations are projected to operate at unacceptable levels regardless of project implementation. In the northbound direction under this scenario, the project would degrade operations at the LOVR northbound off-ramp, but all other northbound merge/diverge locations would operate at an acceptable level.

Mitigation Measures. The measures listed below would also be required to mitigate impacts to ramp junction operations under the Buildout Plus Project scenario:

T-7(a) To mitigate significant impacts to the ramp junctions on southbound U.S. 101, the project shall contribute its fair share, as determined by the City,

to the construction of a southbound auxiliary lane between Prado Road and LOVR.

T-7(b) To mitigate significant impacts to the northbound off-ramp from US 101 to LOVR, the project will pay fair share traffic mitigation fees to the City, some of which will be applied to the reconstruction of the LOVR interchange, including the lengthening of the deceleration area to City and Caltrans standards in the on-going design of the interchange.

T-7(c) Under Buildout Plus Project Conditions which includes buildout of the City's General Plan (projected to occur over the next 30 years and beyond) and the proposed project, the addition of a third lane on the freeway mainline may be required in order to meet Caltrans Level of Service standards. However, the third lane on U.S. 101 would be a regional improvement overseen by a state agency (Caltrans), and is beyond the scope of an individual development such as the proposed project. Under Buildout Conditions, the addition of traffic from numerous future projects, regardless of size, would have a significant impact to U.S. 101 without providing additional mainline capacity.

Significance After Mitigation. The addition of auxiliary lanes and lengthening of the diverge area would result in acceptable freeway operations. Thus, the impact would be reduced to a less-than-significant level. The construction of a southbound auxiliary lane between Prado Road and LOVR described under Measure T-7(a) could be accommodated within existing roadway right-of-way, and would therefore not result in additional environmental impacts. The proposed project would contribute to significant impacts to the LOVR southbound on-ramp under Buildout Conditions which includes future growth from buildout of the City's General Plan. The required payment of fees, some of which will be applied to the reconstruction of the LOVR interchange, as described under Measure T-7(b), would reduce this impact to a less than significant level.

The addition of a third lane on the freeway mainline is required to reduce cumulative impacts on the mainline segment of U.S. 101 adjacent to the project site. This would be a regional improvement which is beyond the scope of an individual development. Nevertheless, since the proposed project would contribute to this impact, the mitigation of which would require approval from Caltrans, which cannot be assured, the proposed project would result in a Class I, *significant and unavoidable,* impact.

Impact T-8 **Project-generated traffic is projected to degrade or exacerbate weaving operations on US 101 between Madonna Road and Prado Road during the PM peak hour under Buildout Plus Project conditions. Therefore, the proposed project would result in a Class I, *significant and unavoidable* impact.**

Table 4.10-17 Summary of Intersection Levels of Service (continued)

	10-Year Conditions						Buildout Conditions					
	No Project		Plus Project		Mitigated		No Project		Plus Project		Mitigated	
Intersection	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1) Madonna/LOVR	**160**	**F**	**> 200**	**F**	**140**	**F**	**> 200**	**F**	**> 200**	**F**	**180**	**F**
2) Madonna/Oceanaire	14	B	18	B			22	C	35	C		
3) Madonna/Dalidio	59	E	**114**	**F**	36	D	**89**	**F**	**150**	**F**	32	C
4) Madonna/El Mercado	20	C	21	C			23	C	24	C		
5) Madonna/101 SB Ramps	53	D	**65**	**E**	43	D	43	D	49	D	37	D
6) Madonna/101 NB Ramps	50	D	**62**	**E**	37	D	42	D	51	D	45	D
7) Madonna/Higuera	18	B	20	C			19	B	20	C		
8) South/Higuera	21	C	22	C			23	C	24	C		
9) LOVR/Auto Park	15	B	15	B			33	C	33	C		
10) LOVR/Calle Joaquin	43	D	43	D			61	E	**61**	**E**		
11) LOVR/101 NB Ramps	8	A	8	A			14	B	14	B		
12) LOVR/Higuera	14	B	14	B			32	C	34	C		
13) Higuera./Tank Farm	21	C	23	C			40	D	44	D		
14) Higuera/Prado	59	E	71	E	38	D	83	F	**104**	**F**	78	E
15) Prado/101 NB Ramps	16	B	21	C			19	C	27	C		
16) Prado/101 SB Ramps	14	B	14	B			31	C	28	C		
17) Calle Joaquin/101 SB Ramps	14	B	14	B			54	D	54	D		

Notes: (U) = Unsignalized intersection under existing conditions; Delay = Average stopped delay in seconds per vehicle at signalized intersections and average total delay in seconds per vehicle at unsignalized intersections; LOS = Level of Service. Worst case LOS for an individual movement or approach presented in parentheses; Unacceptable intersection operations in bold type.
Source: Fehr and Peers, Inc., 2003.

Table 4.10-18 Buildout Plus Project Freeway Ramp Junction PM Peak Hour Service Levels

Ramp Location	Buildout (No Project) Conditions		Buildout Plus Project Conditions	
	Density	Merge/Diverge LOS	Density	Merge/Diverge LOS
Southbound Ramps				
Dalidio SB On	36.1	E	38.1	F
LOVR SB Off	37.9	F	40.4	F
LOVR SB On	41.9	F	44.2	F
Northbound Ramps				
LOVR NB Off	33.2	C	35.1	E
LOVR NB On	30.3	C	32.1	D
Dalidio NB Off	30.8	D	32.8	D

Notes: Operations calculated using Highway Capacity Software.
Source: Fehr & Peers Associates, Inc., 2003.

Table 4.10-19 presents the weaving analysis for Buildout Conditions without and with the proposed project.

Table 4.10-19 Weaving Service Levels Buildout Plus Project PM Peak Hour Conditions

Weave Section	Buildout Conditions		Buildout Plus Project Conditions	
	LOS	Additional Capacity Required?	LOS	Additional Capacity Required?
Southbound				
Madonna – Dalidio	E	Yes	E	Yes
Northbound				
Dalidio - Madonna	D	No	E	Yes

Note: Service levels based on nomographs published in Caltrans Highway Design Manual.
Source: Fehr & Peers Associates, Inc., 2003.

The southbound weaving area between the Madonna Road and Prado Road interchange is projected to operate at LOS E with or without the proposed project and would require additional capacity to operate acceptably. In the northbound direction, project-generated traffic is expected to degrade weaving operations requiring additional capacity. This is considered a significant impact.

Mitigation Measures. As noted previously, the addition of a third lane on the freeway mainline would provide additional capacity. This potential regional improvement has been evaluated in the City's adopted General Plan Circulation Element and corresponding EIR, and is beyond the scope of an individual development.

Significance After Mitigation. The noted freeway mainline expansion would require the approval of Caltrans, which cannot be assured. Without expansion of the freeway mainline to six lanes north of Madonna Road and south of the Prado Road interchange, the impact is expected to remain significant under Buildout Plus Project Conditions.

Impact T-9 The proposed project would add traffic to Madonna Road and Los Osos Valley Road where there are gaps in existing pedestrian and bicycle facilities. This would result in a Class II, *significant but mitigable,*

impact under each of the scenarios (Baseline Plus Project, 10-Year Plus Project, Buildout Plus Project) studied.

The office component of the proposed project is anticipated to generate some pedestrian and bicycle trips. Most of these trips would be destined to the adjacent commercial areas with some destined for nearby parks and recreation areas at lunch time. The retail component of the proposed project would generate its own pedestrian and bicycle trips from residential neighborhoods in the area, as well as from transit stops on the Prado Road extension and Madonna Road. The project would provide adequate right-of-way on Dalidio Drive to accommodate bicycle lanes (Class II facilities) and sidewalks along each side of the road.

Pedestrian trips generated in the southeast quadrant of the Madonna Road/LOVR intersection would require pedestrians to travel on Madonna Road adjacent to the office portion of the site where there is currently no sidewalk. Thus, pedestrian and bicycle impacts due to the proposed project are expected to be potentially significant.

Mitigation Measures. The following measures would be required to reduce impacts to pedestrians and bicycle facilities.

T-9(a) To mitigate significant impacts to pedestrian and bicycle safety and facilities, the project should implement the following measures:

- *Construct sidewalks along the project's frontage on Madonna Road to close existing gaps;*
- *Provide public pedestrian access to the proposed open space areas and trail easement along the Laguna Lake Park Extension southwest of the project site.*

Significance After Mitigation. The measures listed above would reduce impacts to pedestrian and bicycle facilities to less than significant levels.

Impact T-10 The proposed project would generate new transit trips at stops on major roadways that do not currently include standard features such as bus turnout and shelters. This would result in a Class II, *significant but mitigable* impact under each of the scenarios studied.

The proposed project would not significantly affect any existing transit routes or access to transit stops in the study area. Existing transit service is provided along Madonna Road and Los Osos Valley Road and access to the existing routes and bus stops would not be significantly impacted by the project. While an increase in ridership is expected, the increased demand could likely be accommodated by the existing transit service in the area. With the extension of Prado Road between U.S. 101 and Madonna Road, SLO Transit would likely adjust existing service to utilize this new major route, based on existing Circulation Element Policies CI 2.1, CI 2.2, and CI 2.7. As part of modifying bus routes, new stop locations may be required on Dalidio Drive. Without adequate bus turnouts, shelters, and other amenities to maintain existing ridership, the project may cause potentially significant impacts to future transit service.

Mitigation Measures. The following measures would be required to reduce impacts to transit service in the project area.

T-10(a) To mitigate potential transit impacts, the project shall construct appropriate transit stops, including turnouts in and around the project site. Potential locations for transit stops include the intersection of Madonna/Dalidio, Prado Road at the main project driveway and an internal project transit stop. Locations for the shelters/turnouts shall be developed in consultation with SLO Transit and City of San Luis Obispo staff. Potential locations include northbound Madonna Road adjacent to the multi-family residential parcel, both sides of Dalidio Drive near the planned signalized intersections serving the site, the intersection of Madonna/Dalidio and an internal project transit stop.

Significance After Mitigation. The above measure would reduce impacts to transit service to less than significant.

Impact T-11 The proposed project would result in substantial congestion to Madonna Road and Los Osos Valley Road, which could potentially affect bus transit headways on these facilities. This would result in a Class II, *significant but mitigable* impact under future conditions with the proposed project.

The addition of project traffic under each of the development scenarios (Baseline, 10-Year, and Buildout Conditions) would increase traffic congestion on the study roadways and cause additional delays for all vehicles, including buses operated by SLO Transit. Under each scenario, measures were identified to mitigate project intersection impacts to a less than significant level except at one intersection under 10-Year and three intersections under Buildout Plus Project Conditions. Overall, transit vehicles are expected to be able to maintain reasonable headways without significant impacts to service.

Mitigation Measures. Implementation of measures T-1(a) through (c), T-3(a) and (b), T-4(a), T-6(a), T-9(a), T-10(a), T-12(a), and T-13(a) through (d) would mitigate the potential transit headway impacts. Measures T-12(a) and T-13(a) through (d) are discussed below.

Significance After Mitigation. The above measures would reduce impacts to transit service to a less than significant level.

Impact T-12 Increases in traffic congestion at the Madonna Road/Los Osos Valley Road intersection would increase the likelihood of cut-through traffic on Oceanaire Drive between Madonna Road and Los Osos Valley Road (north of Royal Way). This would result in a Class II, *significant but mitigable* impact under each of the scenarios studied.

Based on the proposed circulation system shown on the current site plan, the proposed project by itself would not cause any significant off-site neighborhood impacts. The proposed site plan does not include any direct street connections that would increase traffic on residential streets. However, the project would add traffic to the Madonna Road/LOVR intersection and, without mitigation, would subsequently increase overall delay at this intersection. With mitigation under Buildout Plus Project conditions, this location is expected to operate at LOS F. The degradation in operations and increase in delays for the critical movements may increase the potential for traffic to use Oceanaire Drive (north of Madonna Road) as a bypass route around

the Madonna Road/LOVR intersection. The use of this facility by cut-through traffic could be deemed a nuisance or safety problem.

As noted under Existing Conditions, the daily volume on Oceanaire Drive north of Madonna Road is currently 5,400 vpd, which substantially exceeds the City's guideline of 3,000 vpd for a residential collector street. Thus, implementation of the proposed project may contribute to a potentially significant neighborhood impact, depending on the level of cut-through traffic.

Mitigation Measures. The following measure would be required to mitigate impacts of cut-through traffic on area neighborhoods.

T-12(a) The proposed project shall fund a monitoring study of the segment of Oceanaire Drive between Madonna Road and LOVR to assess the effect of traffic from the retail portion of the proposed project. The study shall monitor both traffic volumes and travel speeds using traffic counts and/or origin-destination surveys to determine if traffic is diverting to Oceanaire Drive from the adjacent arterial streets. Surveys should be conducted just prior to the issuance of occupancy permits and after one year of full project occupancy. If the surveys show evidence of an increase in volume (with the threshold to be determined by the City), the project should pay for appropriate mitigation measures. To mitigate potentially significant impacts of excessive speed, traffic calming measures such as curb extensions, traffic circles, speed humps, raised crosswalks or intersections, or street narrowing could be installed. Horizontal displacement measures should be favored over vertical displacement measures to minimize impacts to emergency vehicles, and all measures would have to be acceptable to the City's Public Works Department. More drastic measures such as diverters and street closures could be implemented if the volume of cut-through traffic becomes excessive. Implementation of traffic calming measures should only occur after a comprehensive neighborhood participation process. The City's NTM Guidelines details the process for citizen participation and development of neighborhood traffic improvements.

Significance After Mitigation. The measure above would reduce neighborhood impacts to less than significant levels.

Impact T-13 The proposed site access on the Dalidio Drive/Prado Road extension would result in excessive side street delays, lengthy vehicle queues, and conflicting vehicle turning movements during the PM peak hour between Madonna Road and the US 101 Northbound Ramps under Buildout Conditions. This is considered a Class I, *significant and unavoidable*, impact.

Public Streets Within the Project. Access to the retail component of the project is proposed by driveways on a four-lane extension of Dalidio Drive/Prado Road from the new Prado Road interchange to Madonna Road as shown on Figure 4.10-21. The site access for the business park component of the project is depicted on Figure 2-11. The improved Prado Road

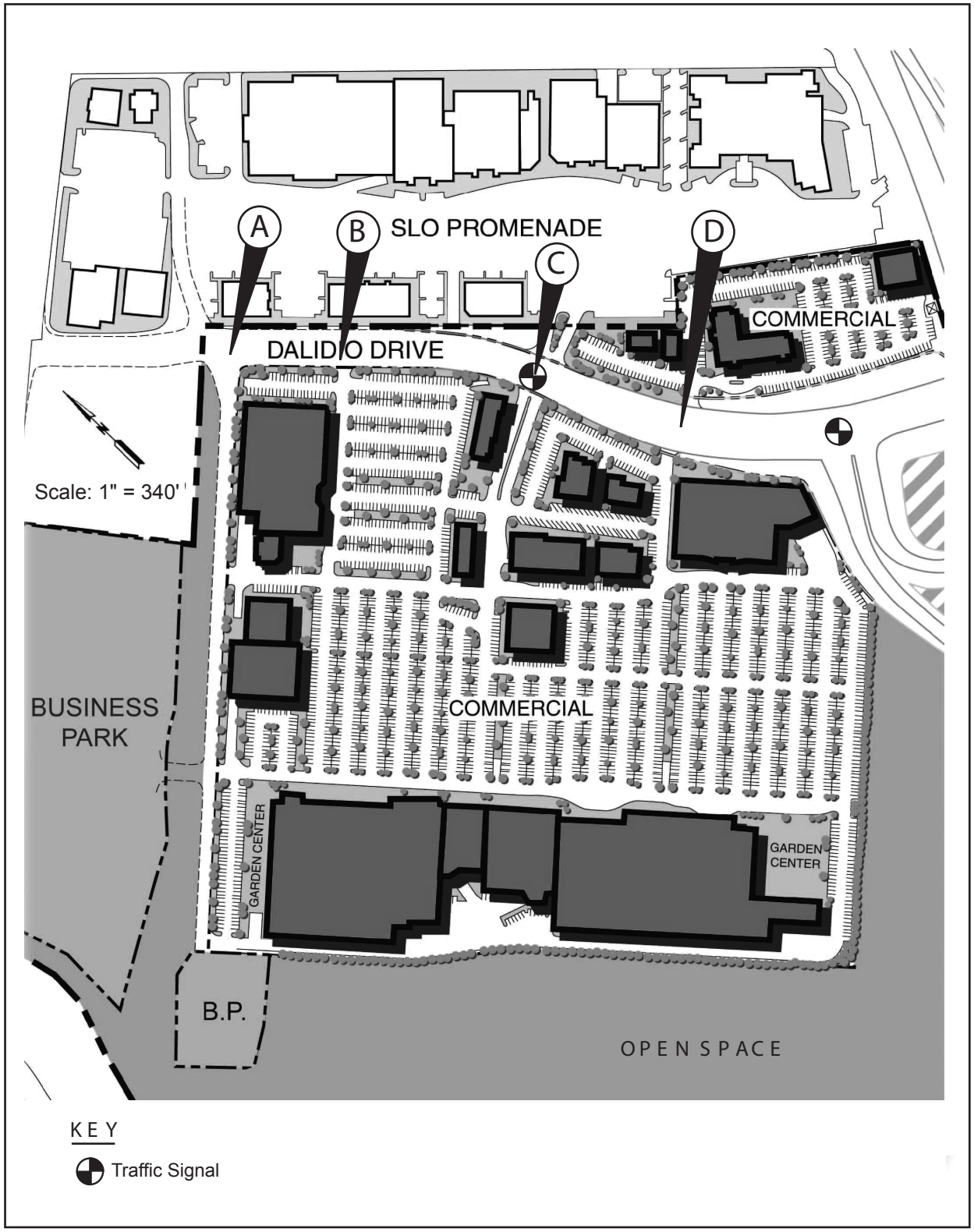
interchange and the arterial connection between the interchange and Madonna Road are identified in the City's General Plan Circulation Element. The extension and new interchange are specified in the Circulation Element as being implemented when development occurs in the Dalidio area.

Access to the office component of the project is proposed from a new two-lane collector street adjacent to the west side of the retail component of the project parallel to Madonna Road. Right-turn only access is assumed on Madonna Road south of the Post Office. The new collector street intersects the Prado Road extension approximately 500 feet east of Madonna Road. The collector street will be extended south to intersect with Los Osos Valley Road. Issues associated with this connection are discussed under Impact T-14 below.

Driveway Access. As shown on Figure 4.10-21, the retail component of the project is served by four driveways located on the Prado Road extension. These driveways provide access to nearly 2,451 of the project's parking spaces on the south side of Dalido Drive and approximately 194 of the project's parking spaces on the north side of the street. Only the easternmost right-turn only driveway will provide direct access to the project's uses north of Prado Road as well as the parking area to the Promenade Center (i.e., a connection between the SLO Promenade parking lot and the north side project uses will permit indirect access via the signalized center driveway). A reciprocal access agreement will be necessary for this to occur. The SLO Promenade property has an existing private road/driveway connection to Dalidio Drive approximately opposite the Post Office driveway. Under the proposed project this intersection will have to be realigned and the existing SLO Promenade parking area be re-configured to align the new collector street with the existing private road/driveway.

Access to the Post Office will be affected by the change in access to SLO Promenade and construction of the new collector street. The existing driveways at the east end of the Post Office property cannot be re-designed to provide adequate access Dalidio Drive. These driveways will be located too close to the new signalized intersection. As such, the traffic flow into the Post Office will have to be changed to permit entrance at the east end of the property and exit at the west end (opposite of the current flow). In addition, delivery vehicles will have to use the same driveways as customers or a new connection will have to be provided through the project office property or over the adjacent drainage channel.

The retail component of the project would also have driveway access from the proposed new collector street. The three driveways would provide secondary access to the main parking area and to truck loading bays serving various buildings, while the third driveway would provide access to the rear of the main shopping center buildings. Vehicular access to the office component is shown schematically on the proposed site plan and the driveway is assumed to be aligned with the center driveway on the new collector street.



Source: Fehr & Peers, Inc., November 2003

Proposed Site Access and On-Site Circulation for Proposed Retail Component

Figure 4.10-21

Based on the projected turning movements and the volumes on Dalidio Drive, traffic signals will be required at the Dalidio Drive/Collector Street intersection and at the main driveway intersection located in the center of the site. These four leg intersections permit full turning movements and signal controlled pedestrian crossings.

Internal Circulation. Figure 4.10-21 shows the proposed internal circulation system for the retail and hotel components of the project. The internal circulation for the portion of the site south of Dalidio Drive includes two-way parking aisles with 90-degree parking and a main entry aisle from the center driveway leading to the center of the site. Only one aisle of two-way diagonal parking is shown just southeast of the Dalidio Drive/Main Driveway intersection. The layout for the north portion is similar except that one dead-end aisle is proposed immediately west of the right-turn only. However, this aisle serves fewer than 60 spaces and is not considered a problem for overall circulation.

Figure 2-11 shows the proposed internal circulation system for the business park component of the project. Two-way parking aisles are proposed between the three buildings. A right-turn only driveway, approximately halfway between Dalidio Drive and Oceanaire Drive, is proposed on Madonna Road. A second driveway provides access to the collector street and the proposed retail development. A dead-end parking aisle is proposed northwest of the building closest to Dalidio Drive. However, this aisle will serve few parking spaces and will not affect overall circulation.

The two signalized project driveways, Dalidio Drive/Collector Street and Dalidio Drive/Main Driveway, were evaluated with level of service calculations to determine if significant queuing and delays would occur as a result of the proposed project. In the near-term scenario, Baseline Plus Project Conditions, vehicles are projected to queue out of the westbound turn pocket and on the exit leg of the main driveway. The Dalidio Drive/Collector Street intersection is projected to operate at acceptable levels of service.

With buildout of the land uses in the City of San Luis Obispo plus the proposed project, through vehicles on Dalidio Drive at the main driveway are projected to extend back through adjacent intersections causing excessive delays and unacceptable traffic operations. This time period is estimated to occur beyond a 20-year time horizon. Additional capacity increases to the Dalidio Drive corridor would be required in order to achieve City LOS thresholds.

Mitigation Measures. The following measures would be required to reduce significant impacts to internal circulation and access on Dalidio Drive between Madonna Drive and the US 101/Dalidio Drive interchange under baseline conditions. These mitigation measures are illustrated on Figure 4.10-22.

T-13(a) Install traffic signals at intersections A and C which provide full access including signal interconnect and communications from Madonna Road to Higuera Street, and install raised medians at the intersections B and D to restrict turning movements at those locations to right turns in and out. No left-turn in access should be permitted at intersections B and D. Provide an additional exit lane and a second westbound left-turn lane on Dalidio Drive at intersection C. Required lane configurations at each intersection are illustrated on Figure 4-10-22. All traffic signals on

Dalidio Drive should be interconnected between Madonna Road and the U.S. 101 northbound ramps.

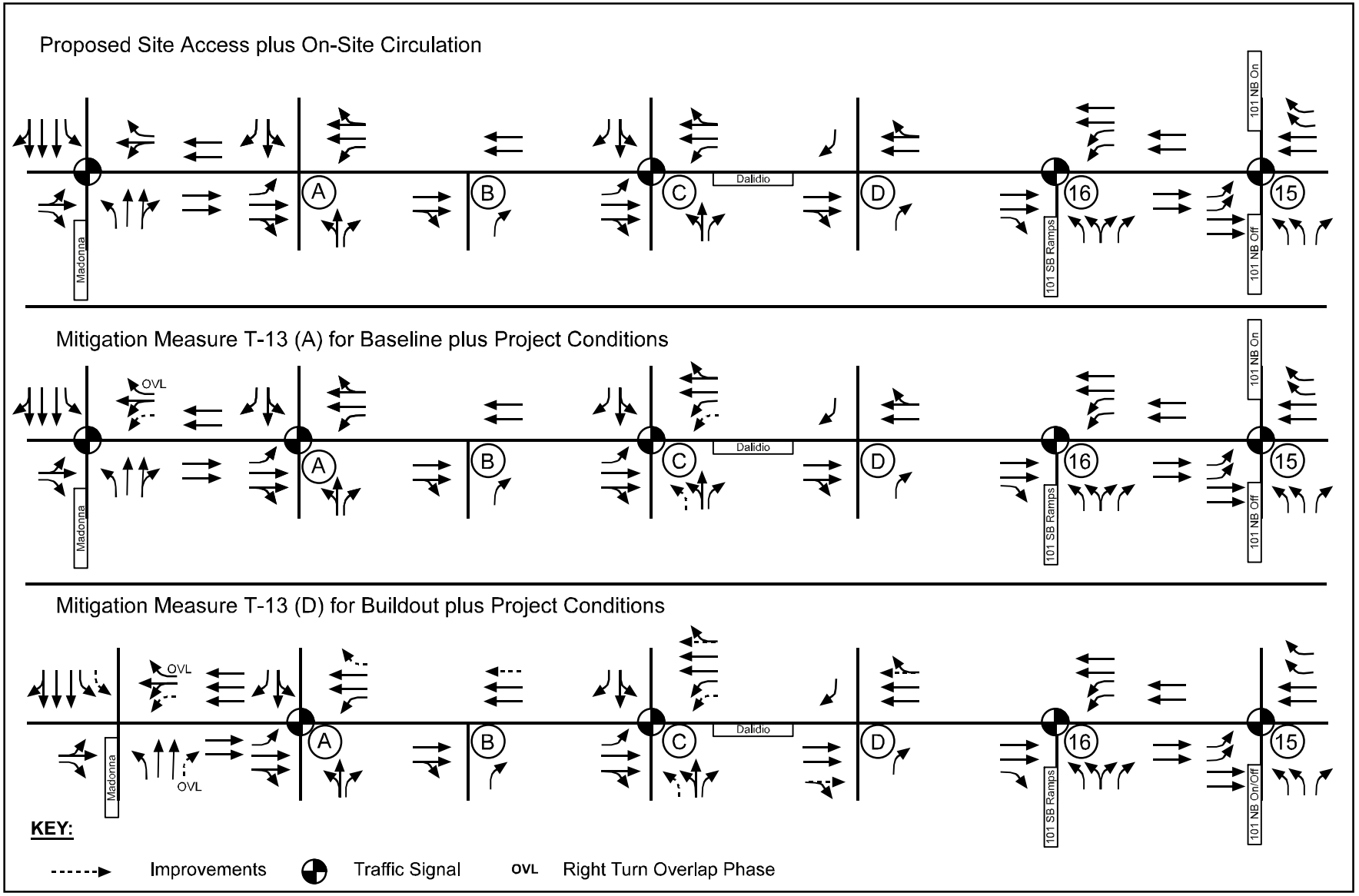
T-13(b) Coordinate with the SLO Promenade to realign the north approach of intersection A to provide signalized ingress and egress and to provide a more direct travel path across Dalidio Drive. Obtain reciprocal access agreements for use of parking drive aisles.

T-13(c) Coordinate with the Post Office to reverse vehicle flow through its lot (i.e., require vehicles to enter at the east end of the property and exit at the west end). In addition, delivery vehicles must be required to use the same driveways as customers, or provide a new connection through the project office property or construct a new driveway over the adjacent drainage channel to intersect with the collector street at least 250 feet south of Dalidio Drive.

In addition to the measures listed above, the project will modify its proposed site plan and construct one of the following improvements in order to mitigate impacts to Dalidio Drive under buildout conditions:

T-13(d) To mitigate long-term (Buildout Plus Project) impacts, the applicant shall preserve right-of-way to construct Dalidio Drive from the U.S. 101 southbound ramp intersection to Madonna Road as a five- to six--lane Parkway Arterial including appropriate building setbacks pursuant to City code. The third westbound travel lane should begin at the southbound ramps intersection and terminate into the westbound right-turn lane at the Dalidio Drive/Collector Street intersection. The third eastbound through lane should begin immediately east of the signalized main driveway (intersection C) and extend to the southbound ramps intersection. The cross-section should contain 12-foot wide travel lanes, 10-foot minimum width left turn bays, and a 6-foot wide Class II bike lane in each direction separated by a raised median. On both sides of the street, a 6-foot wide sidewalk separated from the traveled way by an 8-foot wide landscaped parkway should also be provided. Initial roadway improvements should be constructed with sidewalks curb and gutter in their ultimate location, with a wider than necessary landscaped median where future widening for the additional lanes will take place; or,

T-13(e) To mitigate long-term (Buildout Plus Project) impacts, the applicant shall redesign the project site so that the new collector street will access Dalidio Drive at the main signalized project driveway (C) and construct Dalidio Drive as a five- to six--lane Parkway Arterial including appropriate building setbacks pursuant to City code from the U.S. 101 southbound ramp intersection to Driveway C. Construct a raised median island at the existing Promenade Center private road/driveway so as to preclude left turns out (to eastbound Dalidio) but still maintain left turns onto the private road from Dalidio Drive. This realignment is illustrated on Figure 4.10-23.



Source: Fehr & Peers, Inc., November, 2003

Mitigation for Site Access and On-Site Circulation

Figure 4.10-22

Significance After Mitigation. Measure T-13(a) would reduce the project's near-term impact to a less than significant level. However, the coordination of the traffic signals on Dalidio Drive from Madonna Road to Higuera Street cannot occur without including the two ramp intersections controlled by Caltrans at the Highway 101/Dalidio Drive interchange. Cooperation from Caltrans for the coordination of the traffic signals cannot be assured. Therefore, the project is assumed as a reasonable worst-case scenario to result in Class I, significant and unavoidable, impacts. Measures T-13(d) or (e) would help to reduce delay and congestion at the Dalidio Drive intersections. Coordination with SLO Promenade and the post office in accordance with Measures T-13(b) and (c) cannot be assured. Therefore, these measures are potentially infeasible, and impacts may be considered significant and unavoidable.

Impact T-14 Extension of the proposed collector street to Los Osos Valley Road would potentially change traffic patterns in the area and affect operations on Madonna Road and LOVR. This is considered a Class III, *less than significant* impact.

The project description includes construction of a new collector street that serves the rear of the retail portion of the project site and also provides access to the business park use fronting on Madonna Road south of the existing post office. The project description indicates that that the new collector street could be extended south to intersect with Los Osos Valley Road, providing an alternative to Madonna Road between Dalidio Drive and LOVR. **The collector road would connect to LOVR at the existing, recently installed traffic signal at Froom Ranch Way.**

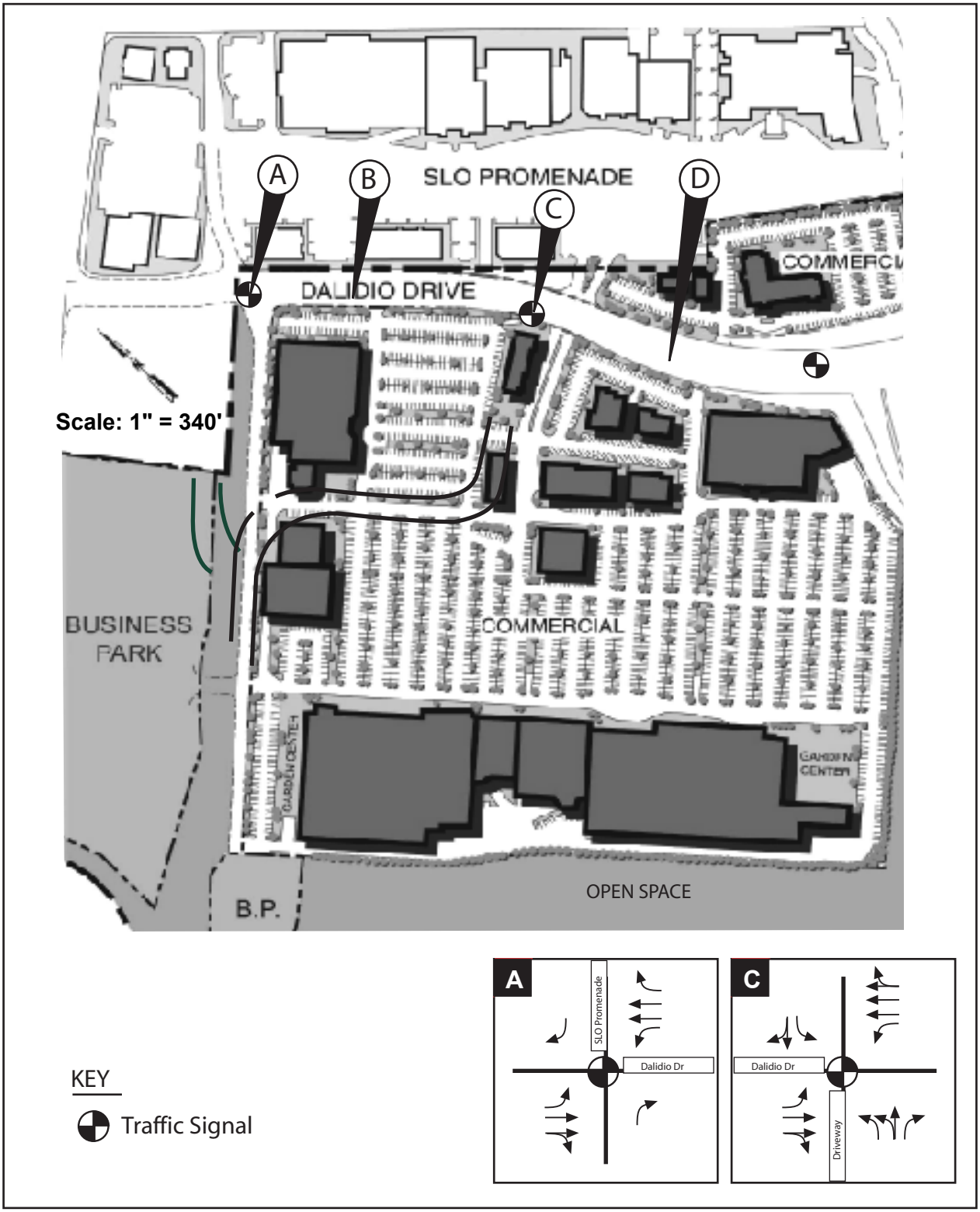
An analysis was conducted to evaluate the circulation effects of extending the collector street to Los Osos Valley Road. The SLOCTM was used to project the change in traffic volumes on surrounding streets with and without the extension of the collector street. Table 4.10-20 below shows the results of this exercise.

Table 4.10-20 Change in Two-Way PM Peak-Hour Traffic Volumes with Extension of Collector Street to LOVR under Buildout Conditions

	Without New Street	w/ Two-Lane Collector Street		w/ Four-Lane Collector Street	
		Change in Volume	% Change	Change in Volume	% Change
Madonna (LOVR–Oceanaire)	4,550	-900	-20%	-1100	-24%
Madonna (Oceanaire-Dalidio)	4,950	-880	-18%	-1090	-22%
LOVR (Madonna to Collector)	3,320	-840	-25%	-710	-21%
LOVR (US 101 to Collector)	3,950	-220	-6%	-300	-8%
Dalidio (Madonna – Collector)	2,950	+430	+15%	+420	+14%
Dalidio (Collector-US 101)	3,100	+160	+5%	+170	+5%
U.S. 101 (LOVR-Madonna)	8,380	-200	-2%	-500	-6%
New Collector Street	0	1,290	N/A	1,820	N/A

Source: Fehr & Peers Associates, Inc., 2003.

In the buildout scenario, the new collector street is projected to serve nearly 1,300 vehicles during the PM peak hour as a two-lane facility, and over 1,800 vehicles if the street includes four lanes. An analysis of the projected turning movement volumes shows that over 80% of the traffic on the two-lane connector street is originating from or destined for the Froom Ranch



Source: Fehr & Peers, Inc., November 2003

Alternative Buildout Plus Project Mitigation
T-13 (E): Realignment of Collector Street

Figure 4.10-23

commercial developments on the west side of LOVR (i.e., Home Depot, Costco, etc.). As a four-lane roadway, over 60% of traffic on this facility would be generated by Froom Ranch. The new collector street provides more direct access to the Froom Ranch site and would be an attractive alternative to using Madonna Road or Los Osos Valley Road to access the site from the north and east parts of the City.

As shown in Table 4.10-20, the greatest reduction in traffic with the extension (900 to 1,100 vehicles in the PM peak hour) is projected to occur on Madonna Road between Los Osos Valley Road and Dalidio Drive. A reduction of 710 to 840 vehicles is projected on LOVR south of Madonna Road. The change in access in this area is expected to increase volumes on Dalidio Drive east and west of the collector street by up to 170 and 430 vehicles, respectively.

While the extension of the new collector street to Los Osos Valley Road provides some benefit to the intersection of Madonna/LOVR, it does not substantially benefit other intersections in the vicinity of the project, and actually increases turning movements at several key locations. While extending the collector street is not required to mitigate near-term project impacts at the Madonna/LOVR intersection, the collector road would provide additional capacity to the local roadway system and reduce overall cumulative impacts to the local transportation system. Analysis of the extension reveals that it primarily serves the Froom Ranch site and other uses immediately surrounding the Froom Ranch site. Without the substantial traffic generation of Froom Ranch, the extension would not serve a substantial area nor provide benefits proportionate to its estimated cost. The extension diverts little project traffic and does not substantially reduce the project's impacts at other intersections but does allow for a future reliever route between LOVR and Dalidio Drive.

Mitigation Measures. The following measure is recommended to preserve vehicular circulation options within the study area:

T-14(a) Construct the proposed collector street from Dalidio Drive to the south edge of the property as a two-lane roadway with sidewalks. ~~If the collector street is ultimately extended to LOVR,~~ Preserve right-of-way and setbacks **on-site** to accommodate a **three-lane** ~~two-lane~~ roadway with a center two-way left-turn lane, sidewalks and bicycle lanes in both directions from the south edge of the property to LOVR. The project will be responsible for bonding **or providing another appropriate security for** ~~of~~ roadway improvements not constructed as part of initial project development. ~~Development at the south end of the collector street should not preclude extension of the roadway to LOVR as a three-lane facility with median, sidewalks and bicycle lanes~~.

Significance After Mitigation. Impacts would be less than significant with this measure.

Impact T-15 Without providing secondary access, some portions of the project site would only provide one access point for emergency vehicles. This is considered a Class II, *significant but mitigable* impact.

As shown on Figure 4.10-21, the proposed retail components on the project site should have at least two vehicular access points that could be used by emergency vehicles. However, the site plan does not show specific driveway access locations for the office parcel located between the

proposed collector street and Madonna Road. Provision of only one driveway to this portion of the site could result in a potentially significant emergency access impact.

Mitigation Measures. The following measure should be implemented to mitigate the potential emergency access impact:

T-15(a) The office portion of the site should be designed to provide at least two vehicular access driveway on the proposed collector street and/or Madonna Road. Additional driveways could be gated with keys provided to fire department staff for emergency use only.

Significance After Mitigation. Impacts would be less than significant.

Impact T-16 The proposed project will provide a parking supply that exceeds the City's code requirements. This is considered a Class III, *less than significant* impact.

As indicated earlier, the proposed project would provide 2,645 parking spaces (2,451 parking spaces on the south side of Dalidio Drive and approximately 194 parking spaces on the north side of the street). The City of San Luis Obispo's Zoning Ordinance requires a parking supply of one space for every 200 ft² of specialty retail space, one space for every 300 ft² of general retail space, one space for every 300 ft² of office space, and one space for per hotel room plus 1 space for the manager and spaces for eating and assembly (i.e., conference facilities). Therefore, the proposed project is required to provide 2,573 spaces according to City code. The amount of parking proposed by the project would exceed the City's requirements by 72 spaces. A total of 36 handicapped-accessible spaces would be required, and 60 spaces would be provided.

A comparative analysis of parking code requirements and strategies of fifteen jurisdictions in the San Francisco Bay Area and three Central Coast communities are presented in Table 4.10-21. Based on the parking code requirements presented in Table 1, the City of San Luis Obispo currently requires parking at rates that are in the middle of the range for other jurisdictions.

Table 4.10-21 Parking Requirement Comparison Summary

Jurisdiction	Parking Code Requirement	
	Office	Retail
Central Coast Communities		
San Luis Obispo	**1 space / 300 square feet**	**1 space / 200 square feet**
Santa Maria	1 space / 250 square feet	1 space / 250 square feet
Paso Robles	1 space / 250 square feet	1 space / 250 square feet
Santa Barbara	1 space / 250 square feet[1]	1 space / 250 square feet
San Francisco Bay Area Communities		
City of Fremont	1 space / 300 square feet	1 space / 300 square feet
City of Belmont	1 space / 250 square feet	1 space / 250 square feet
City of Berkeley	1 space / 400 square feet	1 space / 500 square feet
City of Brentwood	1 space / 250 square feet	1 space / 100 square feet
Town of Danville	1 space / 225 square feet	1 space / 250 square feet
City of El Cerrito	1 space / 500 square feet	1 space / 300 square feet
City of Menlo Park	6 spaces / 1,000 square feet	6 spaces / 1,000 square feet
City of City of Merced	2 spaces / 250 square feet[2]	1 space / 300 square feet[3]
City of Milpitas	1 space / 200 square feet[4]	1 space / 200 square feet[5]
City of Mountain View	1 space / 300 square feet	1 space / 180 square feet
City of San Francisco	1 space / 500 square feet	1 space / 500 square feet

Table 4.10-21 Parking Requirement Comparison Summary

City of San Jose	1 space / 250 square feet	1 space / 200 square feet
City of San Mateo	2.6 spaces / 1,000 square feet	1.9 spaces / 1,000 square feet
City of Santa Clara	1 space / 300 square feet	1 space / 200 square feet
City of Union City	1 space / 200 square feet[6]	1 space / 175 square feet
City of Walnut Creek	3.3 spaces / 1,000 square feet	1 space / 300 square feet

Notes:
[1] Office is allowed to provide only 70% of parking for buildings greater than 50,000 square feet.
[2] One space per 250 square feet or one space per employee, which ever is greater.
[3] Plus one space per vehicle used in connection with the business.
[4] Office upper floors 1 / 400 square feet.
[5] Retail upper floors 1 / 300 square feet.
[6] Office upper floors 1 / 300 square feet.

Source: *Fehr & Peers Associates, Inc., 2003.*

Mitigation Measures. No mitigation measures are required since the project is expected to provide sufficient parking.

Significance After Mitigation. Impacts would be less than significant.

A summary of the mitigation measures by scenario is presented in Table 4.10-22

Table 4.10-22 Summary of Traffic and Circulation Mitigation Measures by Scenarios

	Analysis Scenario with Project		
Mitigation Measure	**Baseline**	**10-Year**	**Buildout**
T-1a Madonna/LOVR	X	X	X
T-1b Madonna/Dalidio	X	X	X
T-1c Prado/Higuera	X	X	X
T-3a Madonna/Dalidio		X	X
T-3b US 101 SB Ramps /Madonna		X	X
T-4a US 101 NB Ramps/Madonna		X	X
T-5a US 101/LOVR SB On-Ramp Merge Extension		X	
T-6a Madonna/Dalidio			X
T-7a US 101 SB Auxiliary Lane (Prado to LOVR)			X
T-7b US 101/LOVR NB Off-Ramp Diverge Extension			X
T-7c US 101 Freeway Third Lane			X
T-9a Pedestrian Improvements	X	X	X
T-10a Transit Improvements	X	X	X
T-12a Oceanaire Study and Improvements	X	X	X
T-13a Signal Installation at Full Access Driveways	X	X	X
T-13b Coordinate with SLO Promenade	X	X	X
T-13c Coordinate with Post Office	X	X	X
T-13d Preserve ROW for Widening Dalidio Drive			X
T-13e Alternative Mitigation: Redesign Collector Street			X
T-14a Construct Collector Street and Preserve ROW for 3-Lanes	X	X	X
T-15a Emergency Access to Office Parcel	X	X	X

Source: Fehr & Peers Associates, Inc., 2003.