4.13 TRAFFIC AND TRANSPORTATION

This chapter includes a description of existing traffic and circulation conditions; transit, bicycle, and pedestrian facilities; and parking conditions in and around the Plan Area. The chapter examines the effect of the Plan on each of these components. The analysis of traffic and transportation conditions was prepared by TJKM Transportation Consultants in November, 2009. A complete copy of the traffic level of service analysis worksheets, prepared by TJKM, is included as Appendix D of this EIR and is available for review at the City of Lafayette.

For clarity, this chapter is organized by topic, as follows:

- Section A: Traffic and Circulation
- Section B: Transit, Pedestrian, and Bicycle Facilities
- Section C: Parking

A. Traffic

This section describes the regulatory framework, existing conditions, impacts, and mitigation measures concerning traffic for the Plan.

Operational traffic analyses typically focus on intersections rather than roadway segments, because traffic capacity constraints in urban areas usually take place at intersections. Study intersection operations were evaluated using level of service calculations, based on methodology outlined in the 2000 Transportation Research Board Highway Capacity Manual (HCM). Level of service is a description of the operating conditions at intersections, ranging from level of service (LOS) A (indicating free flow traffic conditions with little or no delay) to LOS F (representing oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). In most cases, the level of service analysis is performed using intersection turning movement volumes during each of the AM and PM peak hours; the analysis presented herein also includes the mid-day peak hour that occurs around afternoon school dismissal.

At signalized intersections, the level of service rating is based on the weighted average control delay measured in seconds per vehicle. The relationship between the control delay and level of service for signalized intersections is summarized in Table 4.13-1. In addition to the control delay and level of service relationships shown in the table, the City of Lafayette has the following definitions:

- "Good" LOS D is defined as 35 to 45 seconds of average control delay per vehicle.
- "Poor" LOS D is defined as 45 to 55 seconds of average control delay per vehicle.

To evaluate unsignalized intersections, the operations method of the 2000 HCM was utilized. When the intersection is controlled with one- or two-way stop signs this methodology determines the level of service based on delay for the worst approach. When the intersection is controlled with all-way stop signs, the delay is an average for all approaches. Level of service criteria for unsignalized intersections are summarized in Table 4.13-2.

1. Regulatory Framework

a. Lafayette General Plan

The Lafayette General Plan provides a description of the functional classification hierarchy of city streets as follows (a description of the street network in the study area is provided in Section 4.13.A.2):

- **Arterial Roadways.** Arterial streets are the major streets within the city that carry the traffic of local and collector streets to and from the freeways and other major streets, with controlled intersections, providing the primary routes through the city. In Lafayette, arterial roadways generally provide direct access to properties.
- **Collector Roadways.** Collector streets distribute traffic between local streets and major arterials and provide for through traffic movement within a limited area. Collector streets also connect residential neighborhoods with arterial streets as well as give direct access to abutting properties.

TABLE 4.13-1 **SIGNALIZED INTERSECTION LEVEL OF SERVICE CRITERIA**

LOS	Description	Average Control Delay (Seconds)
A	Free flow/non-congested operation. Turning movements are easily made and all queues clear in a single signal cycle.	≤ 10.0
B	Stable operation/minimal delays. An occasional approach phase is fully utilized. Drivers begin to feel somewhat restricted within platoons of vehicles.	> 10.0 to 20.0
C	Stable operation/acceptable delays. Major approach phases fully utilized. Backups may develop behind turning vehicles.	> 20.0 to 35.0
D	Approaching unstable operation/tolerable delays. Drivers may have to wait through more than one red signal indication. Queues may develop but dissipate rapidly, without excessive delays.	> 35.0 to 55.0
E	Unstable operation/significant delays. Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream of intersection.	> 55.0 to 80.0
F	Forced flow/excessive delays. Represents jammed conditions. Traffic demand exceeds the capacity. Queues may block upstream intersection.	> 80.0

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

- **Local Roadways.** The primary function of local streets is to provide direct access to abutting properties. When through traffic is permitted to use local streets, the result is the disruption of neighborhoods and traffic hazards, so they are often designed to discourage through traffic.
- **State Highways and Freeways** are designed as higher-speed and higher-capacity limited-access facilities, which are intended to meet the need for relatively longer regional and intercity trips. The State of California Department of Transportation (Caltrans) controls the design, operation, and maintenance of freeways and State highways.

TABLE 4.13-2 **UNSIGNALIZED INTERSECTION LEVEL OF SERVICE CRITERIA**

LOS	Description	Average Control Delay (Seconds)
A	Free flow/non-congested operation.	≤ 10.0
B	Stable operation/minimal delays.	> 10.0 to 15.0
C	Stable operation/acceptable delays.	> 15.0 to 25.0
D	Approaching unstable operation/tolerable delays.	> 25.0 to 35.0
E	Unstable operation/significant delays.	> 35.0 to 50.0
F	Forced flow/excessive delays.	> 50.0

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

The General Plan Circulation Element identifies goals, policies, and programs related to the city's street network. Goals and policies relevant to the Plan are listed in Table 4.13-3.

b. Contra Costa Transportation Authority Guidelines

The Contra Costa Transportation Authority (CCTA) serves as the Congestion Management Agency (CMA) for Contra Costa County. CCTA's most recently adopted Congestion Management Program (CMP) is the 2007 CMP Update.

The Revised Draft Lamorinda Action Plan Update (DKS Associates, December, 2009) and the 2009 Countywide Comprehensive Transportation Plan (adopted June 17, 2009) establish Multimodal Traffic Service Objectives (MTSOs) for routes of regional significance in Lamorinda. An MTSO used to measure freeway and arterial operations is peak hour Delay Index, which is defined as the ratio of peak period travel time to off-peak period travel time on each roadway segment. For example, a Delay Index of 2.0 means that it takes twice as long to travel a particular segment during the peak commute hour than during non-commute hours when traffic moves at free-flow speeds.

TABLE 4.13-3 **GENERAL PLAN POLICIES RELEVANT TO TRAFFIC**

Goal/Policy Number	Goal/Policy Content
Policy C-1.2	Level of Service Standards and Goals: Establish the following level of service standards and goals. Transportation improvements must be consistent with the community's strong desire to preserve Lafayette's unique identity and quality of life. *Signalized Downtown Intersections: LOS Standard is Poor D.* *Signalized Intersections Outside Downtown: LOS Standard is Good D.*
Goal C-2	*Regulate traffic so as to preserve the peace and quiet of residential areas.*
Policy C-2.1	Manage Traffic Flow: Discourage diversion of through traffic onto local streets.
Goal C-3	*Regard the quality of life in Lafayette and maintaining community identity as more important than accommodating through traffic.*
Policy C-3.1	Community Identity and Through Traffic: Place a higher priority on safety, encouraging a pedestrian-oriented design and scale; and on maintaining quality of life and identity of residential neighborhoods than on accommodating through traffic.
Goal C-4	*Coordinate land use and circulation planning.*
Policy C-4.1	Balance Circulation and Land Use Patterns: Limit development to that which can be adequately served by Lafayette's circulation system.

Source: Lafayette General Plan, 2002, http://www.ci.lafayette.ca.us, accessed on October 27, 2009.

Although not used to determine CEQA impacts at intersections, level of service calculations using the CCTA adopted methodology for evaluating signalized intersections were also performed in order to analyze impacts against locally-adopted transportation criteria.

2. Existing Conditions

The study area considered for this traffic analysis is shown in Figure 4.13-1. As shown in the figure, it includes an area bounded approximately by Deer Hill Road to the north, St. Mary's Road to the south, Pleasant Hill Road to the east, and Acalanes Road to the west. This area, which is larger than the

Source: TJKM

FIGURE 4.13-1

STUDY AREA ROADWAYS AND INTERSECTIONS

Plan Area, was selected by TJKM, in consultation with City staff, as the area determined most likely to experience traffic impacts from the Plan.

a. Plan Area Roadway Network

Regional roadway access to downtown Lafayette is provided by connections to State Route 24, by way of Acalanes Road, Oak Hill Road, First Street, Deer Hill Road, Pleasant Hill Road, and Mount Diablo Boulevard. State Route 24 and Pleasant Hill Road north of State Route 24 are considered to be routes of regional significance. Within downtown Lafayette, access to the Plan Area at the local level is provided by a series of arterials, collectors, local streets, and major driveways connecting with Mount Diablo Boulevard, which runs through the entire length of the Plan Area. Another significant component of the roadway network is Moraga Road, which extends south from Mount Diablo Boulevard to the Town of Moraga, and provides local access in the Plan Area by way of connections with collector and local streets and driveways. Downtown Lafayette includes retail, restaurant, office, and other commercial uses; civic uses; transit facilities; schools; and residential neighborhoods all within walking distance of the Plan Area.

The existing circulation network within the study area is composed of a State highway, as well as City arterials, collectors, and local streets. Primary roadways within the study area include the following:

- **State Route 24** is an east-west freeway that runs parallel to the north edge of the Plan Area, connecting Interstate 680 in Walnut Creek with Interstate 980 and Interstate 880 in Oakland, via the Caldecott Tunnel. The freeway is an eight-lane, divided facility with BART tracks running along the median, including a BART station platform in downtown Lafayette. State Route 24 carries about 160,000 vehicles per day through downtown Lafayette. State Route 24 is a route of regional significance.
- **Mount Diablo Boulevard** is an east-west arterial street with two lanes in each direction and with sections of a center left turn lane and sections with dedicated left turn lanes and medians, which extends from Acalanes Road on the west to Pleasant Hill Road on the east, providing access through the entire length of downtown Lafayette. Between Oak Hill

Road and First Street, the number of eastbound travel lanes increases to three lanes. At its easterly and westerly ends, Mount Diablo Boulevard connects with State Route 24 freeway ramps.

- **Moraga Road** is an arterial that runs north-south through the downtown area, connecting Mount Diablo Boulevard on the north with the Town of Moraga to the south. Moraga Road is four lanes north of St. Mary's Road and narrows to two lanes south of St. Mary's Road.
- **Pleasant Hill Road** is a four-lane arterial that runs north-south and connects with State Route 24 at a full interchange on the east end of the study area. It connects Mount Diablo Boulevard with Olympic Blvd to the south and the City of Pleasant Hill and northeasterly areas of Lafayette to the north. Pleasant Hill Road is a route of regional significance north of State Route 24.
- **First Street** is a four-lane arterial between Mount Diablo Boulevard and Deer Hill Road that runs north-south and connects to State Route 24 with an eastbound freeway on-ramp. First Street narrows to two lanes south of Mount Diablo Boulevard, where it runs adjacent to the recently opened Lafayette Library and Learning Center. South of Golden Gate Way, it becomes a one-way southbound roadway that ends at School Street.
- **Oak Hill Road** is a four-lane arterial that runs north-south between Mount Diablo Boulevard and Deer Hill Road and connects to State Route 24 at an eastbound freeway off-ramp. Oak Hill Road terminates at the signalized intersection with Mount Diablo Boulevard and Lafayette Circle (east), a two-lane north- south collector that continues south of the intersection and provides local access.
- **Deer Hill Road** is a four-lane arterial between Happy Valley Road and First Street that runs east-west and connects First Street and Oak Hill Road with westbound State Route 24. Westbound State Route 24 highway on- and off-ramps connect directly to Deer Hill Road, which also provides access to large BART station parking lots at multiple driveways.

Deer Hill Road narrows to two lanes between First Street and Pleasant Hill Road.

- **St. Mary's Road** is a two-lane arterial that runs east-west at the southern periphery of the study area, and connects Moraga Road with southeasterly areas of Lafayette and St. Mary's College in Moraga.

Collector streets in the study area include: **Lafayette Circle (east and west), Dewing Avenue, Happy Valley Road, Mountain View Drive, Dolores Drive, Village Center, Golden Gate Way, Second Street, Brown Avenue, Carol Lane, Moraga Boulevard, Brook Street, and School Street**.

All other streets in the study area not identified above are local streets.

b. Study Area Intersections

Table 4.13-4 provides a summary of the 25 intersections analyzed as part of the traffic study; each numbered intersection in the table is keyed to the locations shown in Figure 4.13-1.

c. Existing Intersection Level of Service

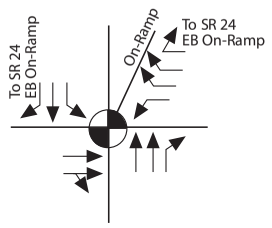
Weekday AM (7:00 a.m. to 9:00 a.m.) and PM (4:00 p.m. to 6:00 p.m.) peak turning movement counts were collected in September 2007 or September 2009, and mid-day (11:45 a.m. to 3:15 p.m.) counts were collected in September 2009, at the intersections listed in Table 4.13-4. At three key intersections of Mount Diablo Boulevard – at Oak Hill Road (#7), Moraga Road (#8), and First Street (#9) – AM and PM peak counts from September 2007 and September 2009 were compared and found to be consistent with each other, and no additional new counts or adjustments at other intersections were deemed necessary. Based on the mid-day counts, the highest hourly volumes observed during the 11:45 a.m. to 3:15 p.m. period at most of the study intersections occurred from 2:15 to 3:15 p.m., because of traffic from local schools. The existing geometry and traffic control at the study intersections are shown in Figure 4.13-2, and the existing AM, mid-day, and PM peak hour turning movement volumes are shown in Figure 4.13-3.

TABLE 4.13-4 **TRAFFIC STUDY INTERSECTIONS IN THE STUDY AREA**

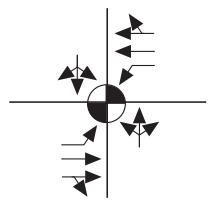
No.	Intersection Location	Signalized/ Unsignalized	Downtown[a]/ Outside
1.	Mt. Diablo Boulevard/Acalanes Road/SR 24 EB Ramps	Signalized	Outside
2.	Mt. Diablo Boulevard/Risa Road/Village Center	Signalized	Downtown
3.	Mt. Diablo Boulevard/Dolores Drive/Mtn. View Drive	Signalized	Downtown
4.	Mt. Diablo Boulevard/Happy Valley Road	Signalized	Downtown
5.	Mt. Diablo Boulevard/Dewing Avenue	Signalized	Downtown
6.	Mt. Diablo Boulevard/Lafayette Circle (west)	Signalized	Downtown
7.	Mt. Diablo Boulevard/Oak Hill Road/Lafayette Circle (east)	Signalized	Downtown
8.	Mt. Diablo Boulevard/Moraga Road	Signalized	Downtown
9.	Mt. Diablo Boulevard/First Street	Signalized	Downtown
10.	Mt. Diablo Boulevard/Second Street	Signalized	Downtown
11.	Mt. Diablo Boulevard/Brown Avenue/Almanor Lane	Signalized	Downtown
12.	Mt. Diablo Boulevard/Carol Lane	Signalized	Downtown
13.	Mt. Diablo Boulevard/Lafayette Park Hotel	Signalized	Outside
14.	Mt. Diablo Boulevard/Pleasant Hill Road/SR 24 EB On-Ramp	Signalized	Outside
15.	Pleasant Hill Road/SR 24 EB Off-Ramp/Old Tunnel Road	Signalized	Outside
16.	Moraga Road/Moraga Boulevard	Signalized	Downtown
17.	Moraga Road/Brook Street	Signalized	Downtown
18.	Moraga Road/School Street	Signalized	Downtown
19.	Moraga Road/St. Mary's Road	Signalized	Outside
20.	Oak Hill Road/SR 24 EB Off-Ramp	Unsignalized	Outside
21.	Deer Hill Road/Happy Valley Road	Unsignalized	Outside
22.	Deer Hill Road/Oak Hill Road	Unsignalized	Outside
23.	Deer Hill Road/SR 24 WB Ramps/Laurel Drive	Signalized	Outside
24.	Deer Hill Road/First Street/Sierra Vista Way	Signalized	Outside
25.	First Street/SR 24 EB On-Ramp	Unsignalized	Outside

[a] Intersection designated as being "downtown" have a different level of service threshold than intersections outside the downtown area, per General Plan definitions.
Source: TJKM, 2009.

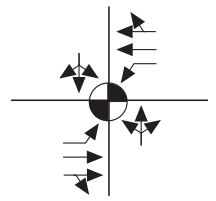
Intersection #1
Mt. Diablo Blvd./Acalanes Rd./
SR 24 EB Ramps



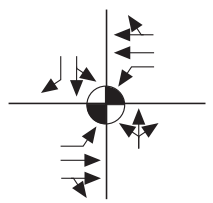
Intersection #2
Mt. Diablo Blvd./Risa Rd./Village Center



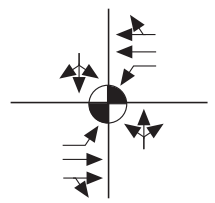
Intersection #3
Mt. Diablo Blvd./Dolores Dr./Mtn.View Dr.



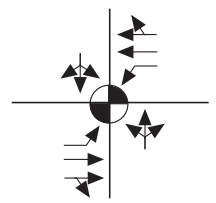
Intersection #4
Mt. Diablo Blvd./Happy Valley Rd.



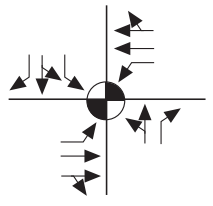
Intersection #5
Mt. Diablo Blvd./Dewing Ave.



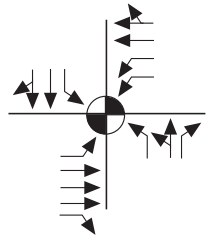
Intersection #6
Mt. Diablo Blvd./Lafayette Cir. (W)



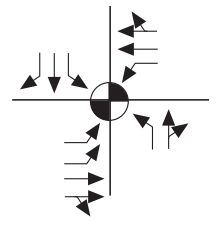
Intersection #7
Mt. Diablo Blvd./Oak Hill Rd./
Lafayette Cir. (E)

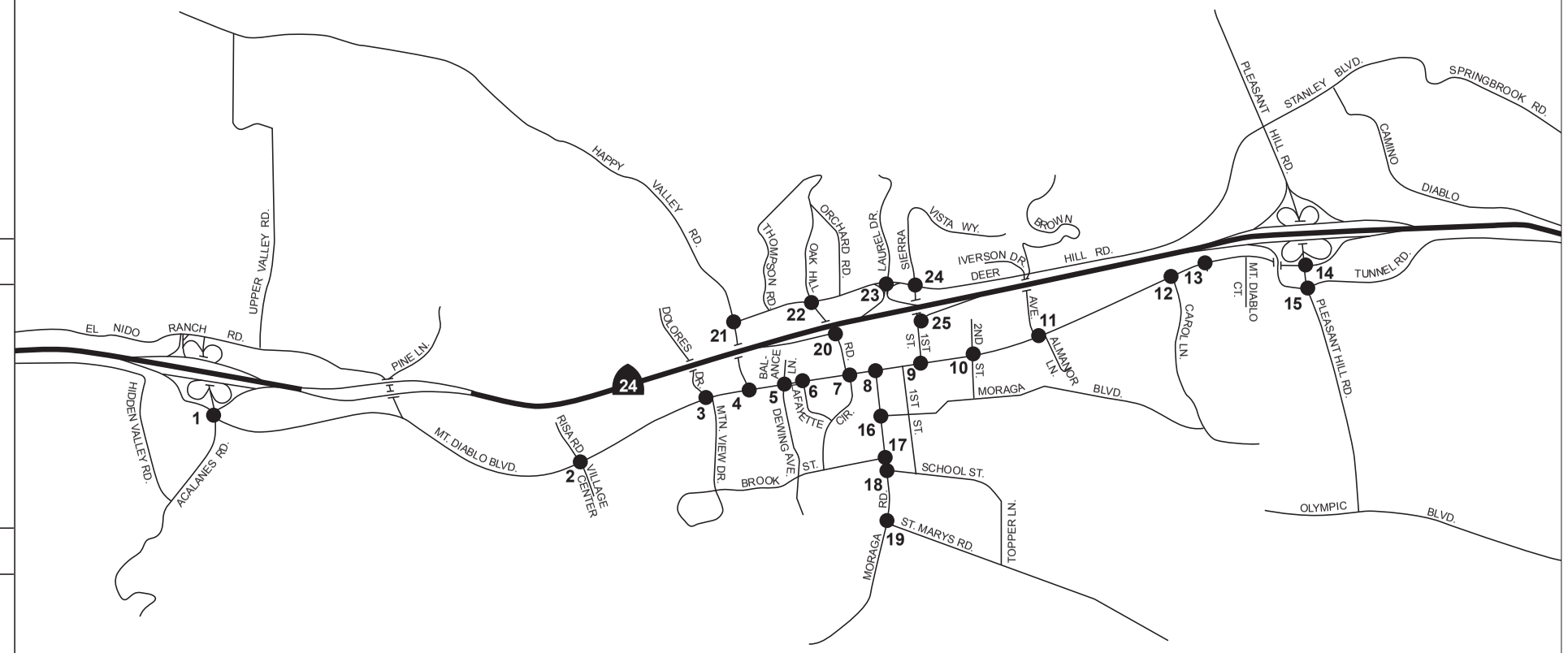


Intersection #8
Mt. Diablo Blvd./Moraga Rd.



Intersection #9
Mt. Diablo Blvd./First St.

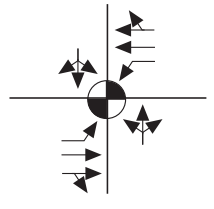




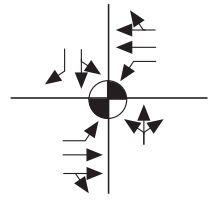
LEGEND
- Study Intersection
- Traffic Signal
- Stop Sign

NORTH
Not to Scale
TJKM

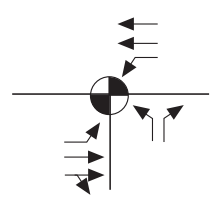
Intersection #10
Mt. Diablo Blvd./Second St.



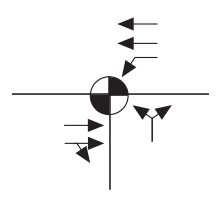
Intersection #11
Mt. Diablo Blvd./Brown Ave./Almanor Ln.



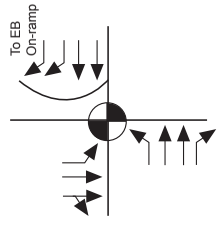
Intersection #12
Mt. Diablo Blvd./Carol Ln.



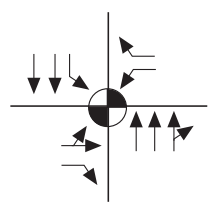
Intersection #13
Mt. Diablo Blvd./Lafayette Park Hotel



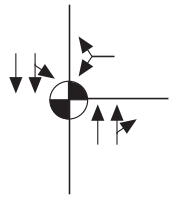
Intersection #14
Mt. Diablo Blvd./Pleasant Hill Rd./
SR 24 EB On-Ramp



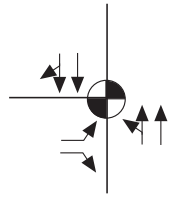
Intersection #15
Pleasant Hill Rd./SR 24 EB Off-Ramp/
Old Tunnel Rd.



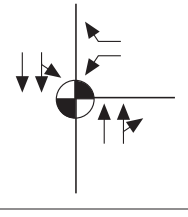
Intersection #16
Moraga Rd./Moraga Blvd.



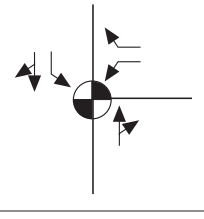
Intersection #17
Moraga Rd./Brook St.



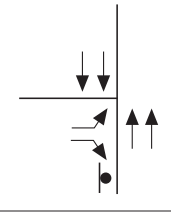
Intersection #18
Moraga Rd./School St.



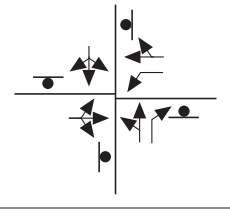
Intersection #19
Moraga Rd./St. Mary's Rd.



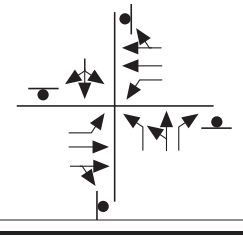
Intersection #20
Oak Hill Rd./SR 24 EB Off-Ramp



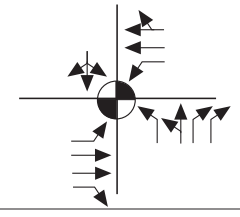
Intersection #21
Deer Hill Rd./Happy Valley Rd.



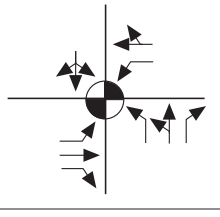
Intersection #22
Deer Hill Rd./Oak Hill Rd.



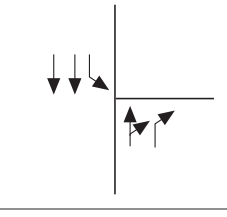
Intersection #23
Deer Hill Rd./SR 24 WB Ramps/Laurel Dr



Intersection #24
Deer Hill Rd./First St./Sierra Vista Wy.



Intersection #25
First St./SR 24 EB On-Ramp

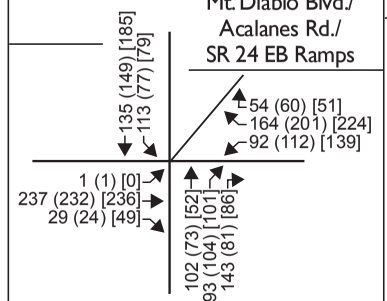


Source: TJKM

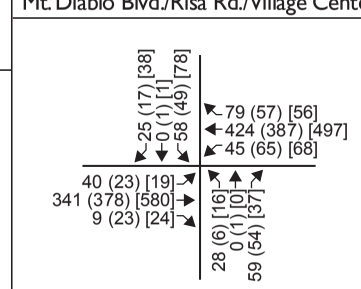
FIGURE 4.13-2

EXISTING GEOMETRY AND TRAFFIC SIGNAL CONTROL

Intersection #1
Mt. Diablo Blvd./
Acalanes Rd./
SR 24 EB Ramps



Intersection #2
Mt. Diablo Blvd./Risa Rd./Village Center



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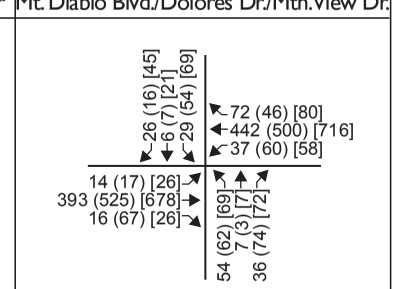
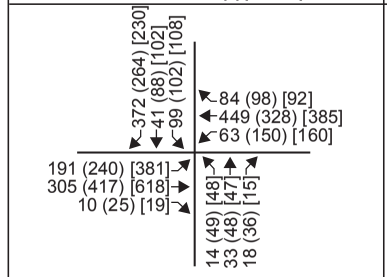
Mt. Diablo Blvd./Dolores Dr./Mtn.View Dr.



Intersection #4
Mt. Diablo Blvd./Happy Valley Rd.



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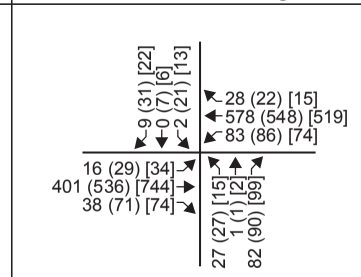
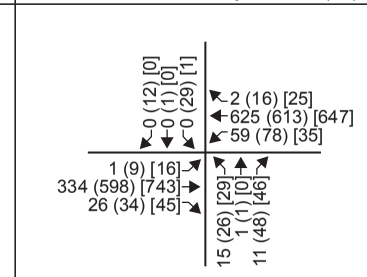
Mt. Diablo Blvd./Dewing Ave.



Intersection #6
Mt. Diablo Blvd./Lafayette Cir. (W)



Intersection #7
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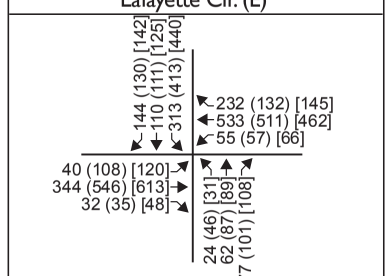
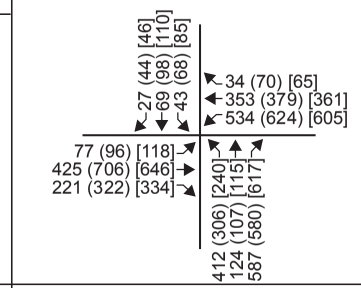
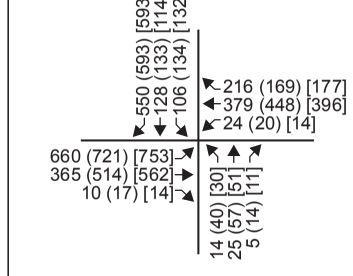
Lafayette Cir. (E)

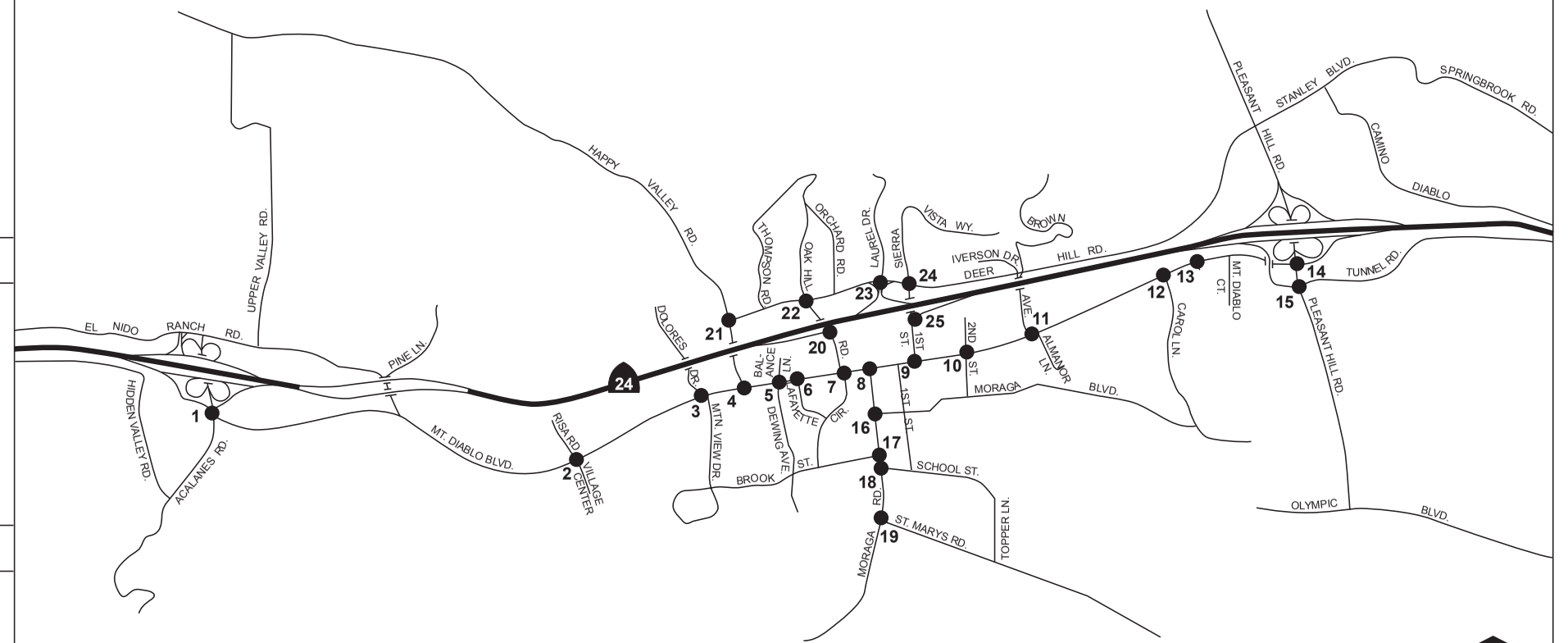


Intersection #8
Mt. Diablo Blvd./Moraga Rd.



Intersection #9
Mt. Diablo Blvd./First St.



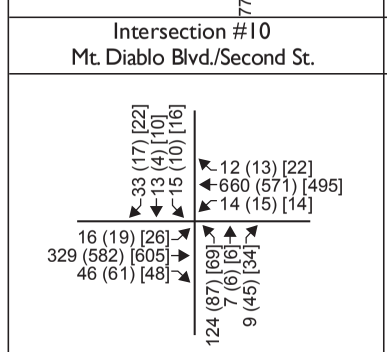


LEGEND

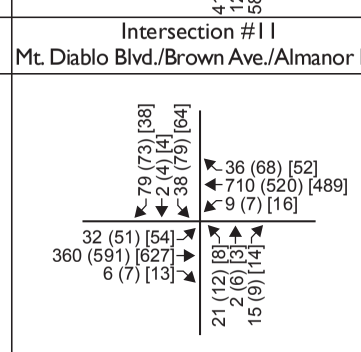
- ● Study Intersection
- XX AM Peak Hour Volumes
- (XX) Midday Peak Hour Volumes
- [XX] PM Peak Hour Volumes

N O R T H
Not to Scale
TJKM

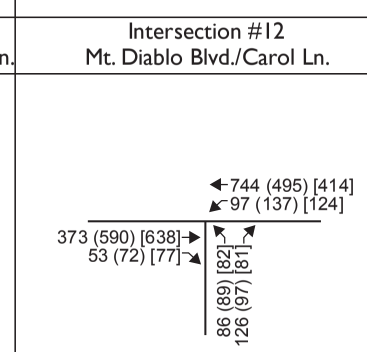
Intersection #10
Mt. Diablo Blvd./Second St.



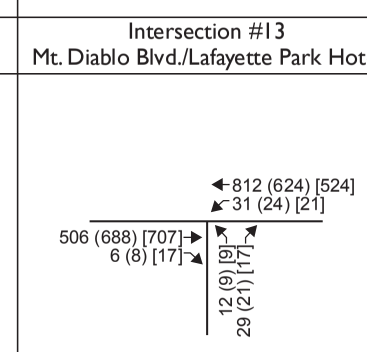
Intersection #11
Mt. Diablo Blvd./Brown Ave./Almanor Ln.



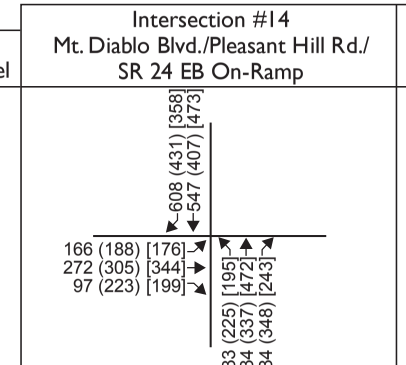
Intersection #12
Mt. Diablo Blvd./Carol Ln.



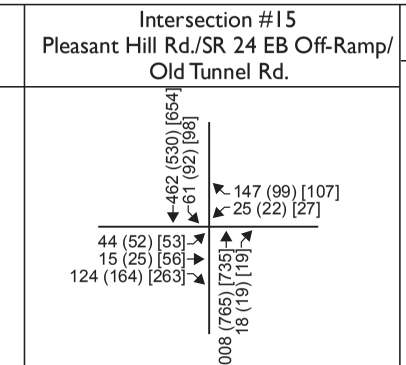
Intersection #13
Mt. Diablo Blvd./Lafayette Park Hotel



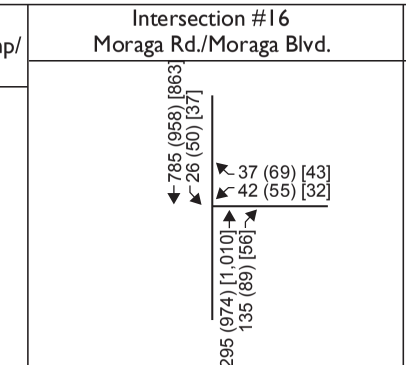
Intersection #14
Mt. Diablo Blvd./Pleasant Hill Rd./
SR 24 EB On-Ramp



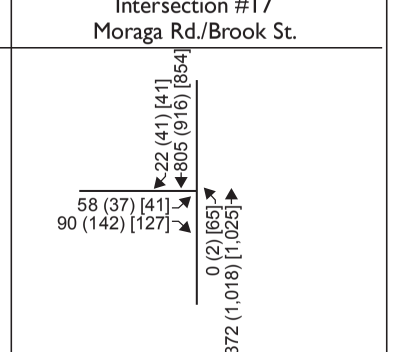
Intersection #15
Pleasant Hill Rd./SR 24 EB Off-Ramp/
Old Tunnel Rd.



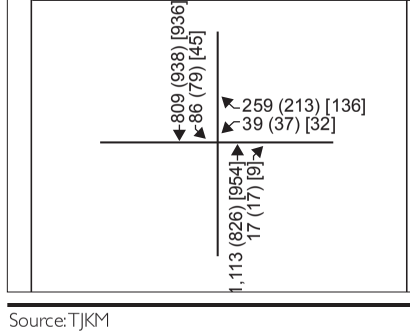
Intersection #16
Moraga Rd./Moraga Blvd.



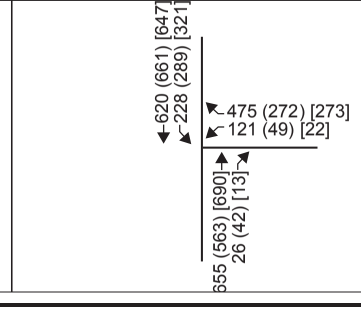
Intersection #17
Moraga Rd./Brook St.



Intersection #18
Moraga Rd./School St.

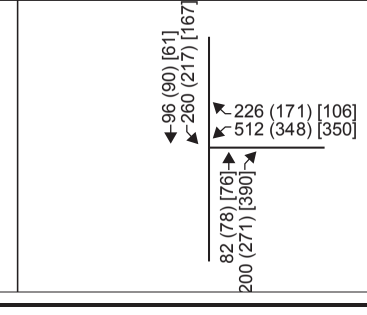


Intersection #19
Moraga Rd./St. Mary's Rd.

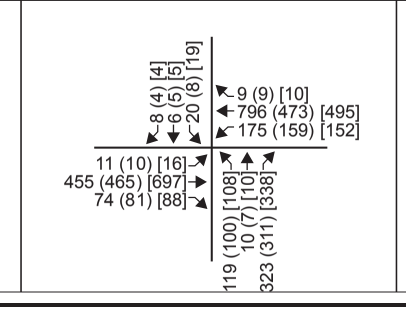


Intersection #20
Oak Hill Rd./SR 24 EB Off-Ramp

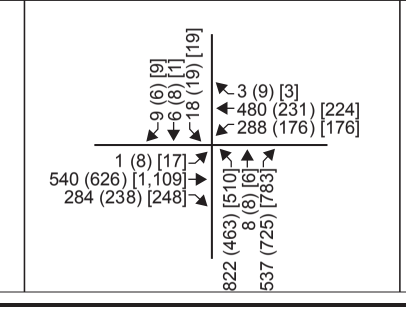
Intersection #21
Deer Hill Rd./Happy Valley Rd.



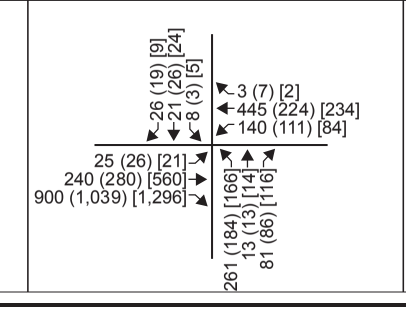
Intersection #22
Deer Hill Rd./Oak Hill Rd.



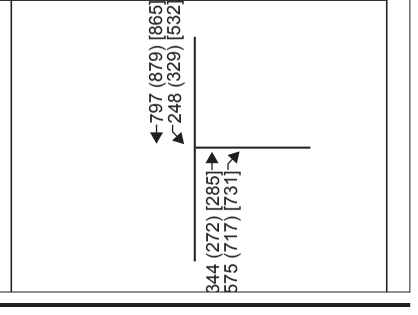
Intersection #23
Deer Hill Rd./SR 24 WB Ramps/Laurel Dr



Intersection #24
Deer Hill Rd./First St./Sierra Vista Wy.



Intersection #25
First St./SR 24 EB On-Ramp



Source: TJKM

FIGURE 4.13-3

EXISTING AM, MID-DAY, AND PM PEAK HOUR TURNING MOVEMENT VOLUMES

Existing levels of service for each study intersection were calculated based on the existing intersection geometry, traffic control, and AM, mid-day, and PM peak hour traffic volumes. The existing intersection level of service calculations were carried out for the study intersections using the methodologies described above, and are shown in Table 4.13-5.

All of the signalized study area intersections currently operate at "good" LOS D or better except the following three intersections:

- **Moraga Road/School Street**: LOS F during the AM and mid-day (2:15 to 3:15 PM) peak hours. Although the worst congestion occurs for less than one hour during each peak period, which coincides with the adjacent school drop-off and pick-up activity, the intersection level of service is unacceptable in the AM and mid-day peaks.
- **Moraga Road/Brook Street:** "Poor" LOS D during the mid-day (2:15 to 3:15 PM) peak hour. Although the peak hour level of service grades are acceptable for this downtown intersection, it is severely affected by both queue spillover and constrained traffic flow from the adjacent Moraga Road/School Street intersection during both the AM and mid-day peak hours.
- **Deer Hill Road/State Route 24 Westbound Ramps:** "Poor" LOS D during the AM and PM peak hours is unacceptable for this intersection outside downtown.

The Mount Diablo Boulevard/Moraga Road intersection operates at an acceptable LOS D during the AM, mid-day, and PM peak periods based on the overall average delay at the intersection, which determines the level of service. However, it should be noted that northbound traffic on Moraga Road approaching the intersection to turn left onto Mount Diablo Boulevard or continue through the intersection experiences average delays of more than a minute during all three peak periods. In addition to high northbound traffic volumes on Moraga Road, these northbound traffic delays are largely related to the relatively short green signal time remaining for northbound left turn

TABLE 4.13-5 **EXISTING INTERSECTION LEVEL OF SERVICE (HCM METHOD)**

	AM Peak		Mid-Day Peak[a]		PM Peak	
Intersections	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**
Signalized Intersections						
1. Mt. Diablo Boulevard/Acalanes Road/SR 24 EB Ramps	B	13.1	B	12.1	A	9.6
2. Mt. Diablo Boulevard/Risa Road/Village Center	B	11.9	B	11.3	A	9.8
3. Mt. Diablo Boulevard/Dolores Drive/Mtn. View Drive	B	11.3	B	13.7	B	17.1
4. Mt. Diablo Boulevard/Happy Valley Road	B	17.5	C	29.3	C	32.5
5. Mt. Diablo Boulevard/Dewing Avenue	B	13.2	B	17.2	B	15.5
6. Mt. Diablo Boulevard/Lafayette Circle (west)	A	5.4	B	11.6	A	7.9
7. Mt. Diablo Boulevard/Oak Hill Road/Lafayette Circle (east)	C	28.2	C	34.0	C	31.7
8. Mt. Diablo Boulevard/Moraga Road	D	42.6	D	44.4	D	35.1
9. Mt. Diablo Boulevard/First Street	C	31.9	D	35.2	C	33.7
10. Mt. Diablo Boulevard/Second Street	A	9.2	A	8.0	A	8.2
11. Mt. Diablo Boulevard/Brown Avenue/Almanor Lane	B	10.7	B	16.5	B	11.2
12. Mt. Diablo Boulevard/Carol Lane	A	7.7	A	9.1	A	9.6
13. Mt. Diablo Boulevard/Lafayette Park Hotel	A	4.8	A	4.8	A	3.8
14. Mt. Diablo Boulevard/Pleasant Hill Road/SR 24 EB On-Ramp	B	12.5	B	14.7	B	14.2
15. Pleasant Hill Road/SR 24 EB Off-Ramp/Old Tunnel Road	B	15.2	B	15.0	B	14.4
16. Moraga Road/Moraga Boulevard	A	2.7	A	5.3	A	4.6
17. Moraga Road/Brook Street	**B**	**19.3**	**D**	**47.1**	**B**	**10.1**
18. Moraga Road/School Street	**F**	**148.3**	**F**	**124.1**	**B**	**13.1**
19. Moraga Road/St. Mary's Road	B	15.9	B	13.9	B	13.3
23. Deer Hill Road/SR 24 WB Ramps/Laurel Drive	**D**	**46.5**	**C**	**34.7**	**D**	**46.8**
24. Deer Hill Road/First Street/Sierra Vista Way	B	13.2	B	11.2	B	16.4
Unsignalized Intersections						
20. Oak Hill Road/SR 24 EB Off-Ramp	B	13.5	B	15.0	A	14.6
21. Deer Hill Road/Happy Valley Road	**F**	**71.4**	**C**	**21.9**	**C**	**23.4**
22. Deer Hill Road/Oak Hill Road	C	20.0	B	13.9	C	19.2
25. First Street/SR 24 EB On-Ramp	A	3.0	A	4.5	B	13.1

[a] Mid-day peak results reported for the 2:15 to 3:15 PM school commute traffic period.
Notes: Rows in bold indicate intersections operating at an unacceptable level of service. Intersections 2 through 12, and 16, 17, and 18 are Downtown intersections, which have a different level of service threshold than intersections outside the downtown area, per General Plan definitions.
Source: TJKM, 2009.

and through traffic in order to accommodate the heavy conflicting eastbound and westbound traffic volumes on Mount Diablo Boulevard.

All of the unsignalized intersections operate at LOS C or better except **Deer Hill Road/Happy Valley Road**, which operates at LOS F during the AM peak hour. This does not meet the General Plan LOS goal.

Traffic volumes are higher at some of the study area intersections during the noon hour when compared to the mid-day (2:15 p.m. to 3:15 p.m.) peak hour used in this analysis, however, separate level of service calculations (using HCM methodology) showed that those intersections currently operate at LOS C or better during the lunchtime hour. The 2:15 to 3:15 p.m. period clearly represents the worst-case mid-day conditions at most study area intersections.

3. Standards of Significance

The Plan would have a significant impact on traffic conditions if it would:

1. Cause signalized downtown intersection (as identified in Table 4.13-4) operations to deteriorate from LOS A, B, C, or D to LOS E or F.
2. Cause operations at a signalized intersection outside downtown (as identified in Table 4.13-4) to deteriorate from LOS A, B, C, or "good" D to "poor" LOS D or to LOS E or F. "Good" LOS D is defined as 35 to 45 seconds of average control delay per vehicle. "Poor" LOS D is defined as 45 to 55 seconds of average delay.
3. Cause the overall level of service at an unsignalized all-way stop control intersection to degrade from LOS D or better to LOS E or F.
4. Cause the level of service at an unsignalized one- or two-way stop control intersection to degrade from LOS E or better for the worst movement from the side street to LOS F, where the intersection also meets at least one warrant for the installation of a traffic signal. Intersections that do not warrant traffic signals should remain unsignalized regardless of the minor street level of service.

5. Cause a Delay Index to exceed 2.0 on State Route 24 or Pleasant Hill Road north of State Route 24.[1]
6. Add vehicle trips to an intersection or roadway operating below the acceptable standard that is applicable, as outlined above.
7. Substantially increase hazards due to a design feature (e.g. sharp curves, intersections or driveways with restricted visibility, etc.).

4. Impact Discussion

This section analyzes future traffic conditions associated with development that could occur under the Plan, including circulation and roadway improvements.

The analysis of traffic impacts in this section addresses impacts at each of the 25 study intersections during the morning, mid-day, and evening peak hours, as defined above. In addition to traffic operations under existing conditions, which are described above, the following scenarios were analyzed for the AM, mid-day, and PM peak hour:

- **Cumulative No Project,** including existing conditions, plus citywide development in Lafayette, Moraga, and Orinda (Lamorinda), and development within the Plan Area that could occur under existing General Plan designations within the 20-year Plan horizon.
- **Cumulative with Specific Plan Project**, including existing conditions, plus projected citywide development throughout Lamorinda, plus development of the Plan Area under the Plan.

The characteristics of each of these scenarios and the results of the analysis of traffic conditions under each scenario are discussed below in the context of

[1] This threshold is based on the Multi-Modal Transportation Service Objectives in the 2009 Countywide Comprehensive Transportation Plan, adopted by the Contra Costa Transportation Authority, which includes SR 24 and Pleasant Hill Road.

the significance thresholds, followed by a statement of conclusion regarding the level of significance.

a. Project Trip Generation and Distribution

The section describes the assumptions that were employed in the analysis of trip generation and distribution for the project scenarios listed above.

i. Trip Generation Adjustments

The Institute of Transportation Engineer's (ITE) *Trip Generation, 8th Edition*, was used to obtain daily and peak-hour trip generation rates and inbound-outbound percentages, which were then used to estimate the number of daily and peak hour trips that can be attributed to the proposed development. These rates are widely accepted by traffic engineering professionals and public agencies as the best source of trip generation information.

However, ITE rates are based on surveys of isolated suburban land uses with negligible transit and little trip linkage between surrounding land uses. The study area has different characteristics than those used as the basis for the standard ITE rates, requiring an adjustment to more closely reflect the mixed-use, transit-oriented development that is envisioned by the Plan.

This traffic analysis adjusts the trip generation rates were lowered in the analysis to reflect local conditions within the study area, including higher densities and the mix of uses, as well as the availability of transit. The adjustments are summarized in Tables 4.13-6 and 4.13-7, and are described as follows:

- **Transit Reduction.** The portions of the study area near the BART station are served by public transit, including BART and County Connection bus service and private taxi-cab service, thus providing many downtown residents, employees, and visitors the choice to not drive for some of their trips. Secure bicycle parking is also provided at the station (approximately 122 spaces). Therefore, as summarized in Table 4.13-6, a reduction for public transportation was applied to the residential and office employment uses that would be developed in the vicinity of the BART

TABLE 4.13-6 **TRANSIT REDUCTION FACTORS**

	AM and PM Commute Peak Hours		Mid-Day Peak Hour and Daily	
BART Proximity*	**Residential**	**Office**	**Residential**	**Office**
Less than ⅛-mile	15%	10%	10%	10%
⅛- to ¼-mile	10%	10%	5%	10%
¼- to ½-mile	5%	5%	5%	5%
Over ½-mile	0%	0%	0%	0%

* Approximate distance from BART station south side pedestrian entrance.
Source: TJKM, 2009. Based on U.S. Census Bureau data, research on development near transit, and City of Lafayette staff.

TABLE 4.13-7 **MIXED-USE REDUCTION FACTORS**

Time Period	Reduction Factor
AM Peak Hour	4%
Mid-Day Peak Hour	6%
PM Peak Hour	8%
Daily	10%

Source: TJKM, 2009. Based on ITE mixed-use adjustment methodology.

station under the Plan. These transit reductions are based on U.S. Census Bureau data for Lafayette and research on actual vehicle trip rates at higher density, mixed-use areas near transit stations (and have been reviewed by City of Lafayette staff). The reductions vary according to distance from the BART station and land use type. These transit adjust-

ment factors were applied consistently to the residential and office uses that would be developed in the Plan Area under the No Project and Project scenarios in this traffic study.

- **Mixed-Use Reduction.** Mixed-use reductions are estimates of the pedestrian and bicycle trips that would remain internal among the mix of complementary uses close to each other in the Plan Area. Reductions for mixed-use, which are summarized in Table 4.13-7, reflect the characteristics of the denser downtown area, where people can walk rather than drive between land uses. Reductions are taken for the interactions among residential and commercial uses and local shopping and restaurants. The reductions vary depending on time period, based on the variations in interactions between the complementary land uses during the day. These mixed-use adjustment factors were applied consistently to the uses that would be developed in the Plan Area under the No Project and Project scenarios in this traffic study.

- **Retail Pass-By Trip Reduction.** Some trips to and from a retail site pass by the site as part of trips between other origins and destinations (e.g., work and home). These trips, which do not result in additional new trips, are called pass-by trips. Based on data presented in the ITE *Trip Generation Handbook, 2nd Edition*, pass-by trip reductions of 25 percent for the PM peak hour and five percent for daily trips were applied to the retail uses that would be developed under the Plan. No pass-by reduction factors were applied to AM peak trips, because many retail uses are assumed not to be open at that time. For the mid-day peak, when retail trips are less likely to be part of another trip already on the roadway network, no pass-by reduction factors were applied. Pass-by reductions are not applied to residential and office uses. The PM and daily pass-by factors were applied consistently to the retail uses that would be developed in the Plan Area under the No Project and Project scenarios in this traffic study.

ii. Trip Distribution and Traffic Assignments

Trip distribution and assignment associated with the Plan were estimated based on forecasts from the Contra Costa Countywide Travel Demand

Model, as presented in the memorandum *Transportation Evaluation of Lafayette Downtown Strategy Alternatives* (Fehr & Peers, June 3, 2008). Trips were assigned to the roadway network based on the trip distributions for residential and commercial land uses for each peak hour, and the likely travel patterns to and from the various Plan Area districts. Table 4.13-8 shows the traffic distribution for each of the external roadway links (or "screenlines") near the perimeter of the study area.

b. Specific Plan Traffic Operations

The following scenarios were evaluated in this study. Both scenarios represent cumulative conditions at the 20-year Plan horizon:

- **Cumulative No Project**, which considers existing traffic plus the growth of the Lafayette area (including the Plan Area), based on the land use designations in the City's General Plan and planned or proposed development projects in Lafayette and elsewhere in Lamorinda.
- **Cumulative with Specific Plan Project,** which considers existing traffic, plus growth in the Lafayette area, including planned or proposed projects in Lafayette and elsewhere in Lamorinda, plus development that is projected to occur under the Plan.

i. Cumulative Traffic Forecasting Methodology and Assumptions

A TRAFFIX model of Lamorinda, which represents future conditions with approved and planned development, was used to derive future traffic volumes for both the Cumulative No Project and the Cumulative with Specific Plan Project scenarios described above.

The TRAFFIX model used in this analysis was initially prepared by Fehr & Peers Transportation Consultants, as part of the *Transportation Evaluation of Lafayette Downtown Strategy Alternatives* study.[2] TJKM revised the model to incorporate approved and planned development in Lafayette and elsewhere in

[2] Fehr & Peers, June 3, 2008, Memorandum from Ellen Poling, Fehr & Peers, to Jim Stickley, WRT, *Subject: Transportation Evaluation of Lafayette Downtown Strategy Alternatives*.

TABLE 4.13-8 **PROJECT-RELATED TRIP DISTRIBUTION**

	Residential Distribution		Commercial Distribution	
Screenline Location	**AM**	**Midday & PM**	**AM**	**Midday & PM**
SR 24 Freeway – West	30%	24%	22%	23%
SR 24 Freeway – East	40%	41%	46%	43%
Pleasant Hill Rd. – North	12%	13%	11%	11%
Pleasant Hill Rd. – South	3%	3%	5%	4%
Moraga Rd. – South	4%	4%	4%	4%
St. Mary's Rd. – South	2%	3%	2%	3%
Happy Valley Rd. – North	0%	1%	4%	4%
Downtown Streets Only	9%	11%	6%	8%
Total	**100%**	**100%**	**100%**	**100%**

Source: TJKM, 2009.

Lamorinda. Major projects included in the cumulative scenario are listed in Table 4.13-9; other development is also factored into the cumulative project scenario, including new residential and non-residential development on infill sites. The complete listing of cumulative future development was reviewed and accepted by City staff prior to preparation of this traffic analysis.

Since the TRAFFIX model forecasts traffic conditions based on trip distribution assumptions, it is the most suitable model for areas that are substantially developed, such as Lafayette and the rest of Lamorinda. This model relies on accurate measurements of existing traffic, plus the generation, distribution and assignment of trips from future development, which are added to existing traffic to determine the total traffic.

TABLE 4.13-9 **MAJOR FUTURE DEVELOPMENT PROJECTS IN LAMORINDA**

Projects	Development Type
Lafayette	
Whole Foods Market	Supermarket: 27,000 square feet
Lafayette Library & Learning Center	Library: 30,300 square feet
Town Center III	Residential Units: 82
The Woodbury	Residential Units: 65
Park Terrace	Residential Units: 18
In-fill housing (outside Downtown)	Residential Units: 378
Moraga	
Moraga Center Specific Plan	Residential Units: 870 Hotel: 85 rooms Retail: 90,000 square feet Office: 50,000 square feet Community Center: 30,000 square feet
Palos Colorados	Residential Units: 123
Rancho Laguna	Residential Units: 22
Other housing	Residential Units: 520
Orinda	
Orinda Gateway Valley	Residential Units: 245

Note: Additional infill development on smaller parcels was included in the model.
Source: TJKM, 2009. Based on consultation with City staff.

ii. Cumulative No Project Traffic Operations

a) Cumulative No Project Land Use

The Cumulative No Project scenario is based on buildout assumptions of the General Plan. Land uses that were assumed to develop in the Plan Area under the current General Plan, and that were used to calculate the No Project vehicle trips in this traffic analysis, are summarized in Table 4.13-10.

TABLE 4.13-10 **NO PROJECT TRIP GENERATION**

				Trip Generation								
				AM Peak Hour			Mid-Day Peak			PM Peak Hour		
Land Use Type[a]	Quantity[b]	Units	Daily Total	Total	In	Out	Total	In	Out	Total	In	Out
Retail[c]	138	KSF	5,035	133	82	51	422	232	190	345	169	176
Office[d]	138	KSF	1,304	197	173	24	56	23	33	181	31	150
Residential[e]	730	DU	4,590	444	112	332	351	169	182	494	286	208
Total			**10,929**	**774**	**367**	**407**	**829**	**424**	**405**	**1,020**	**486**	**534**

KSF = thousands of square feet; DU = dwelling units

Note: Trip generation rates are based on Institute of Transportation Engineers *Trip Generation (8th Edition)*, as modified to reflect transit use, mixed-use internal interaction, and retail pass-by trips.

[a] General Plan land uses.

[b] Land use intensity (number of units).

[c] Shopping Center (ITE Code 820).

[d] General Office Building (ITE Code 710).

[e] Low-Rise Residential Condominium (ITE Code 231).

Source: TJKM, 2009.

b) Trip Generation for No Project in the Plan Area

Daily and peak hour trips that would be attributed to land uses developed in the Plan Area under the current General Plan are shown in Table 4.13-10. These calculations are based on the ITE *Trip Generation, 8th Edition*, and include adjustments that reflect mixed-use, transit-oriented development, and retail pass-by trips as described above.

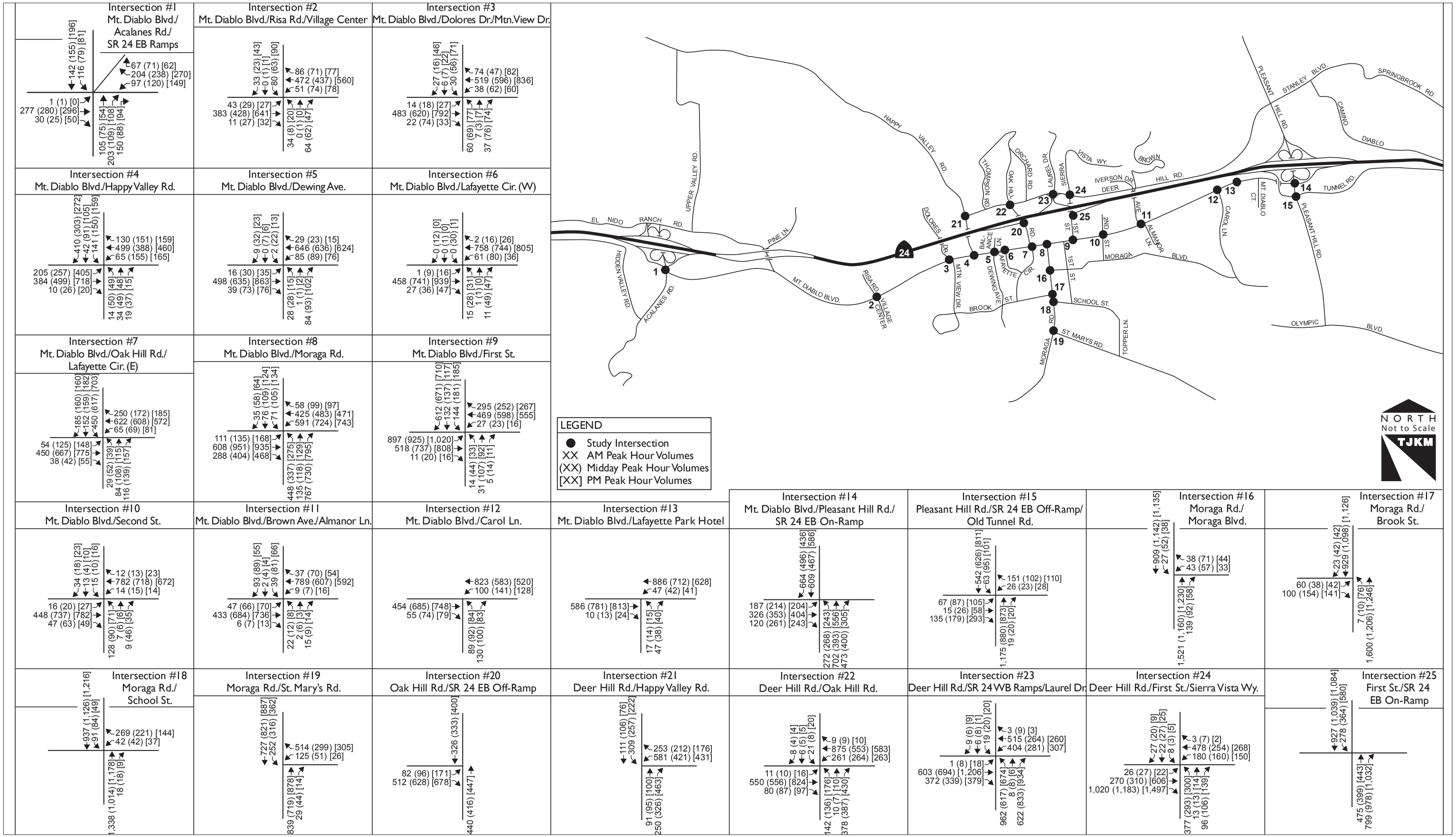
c) Cumulative No Project Traffic Operations

In addition to using future buildout projections, the Cumulative No Project scenario also proposed development projects in or near the Plan Area, including Whole Foods market and several residential projects in Lafayette and Moraga, as well as future projects elsewhere in the Lamorinda. The peak hour turning movement volumes for Cumulative No Project conditions are shown in Figure 4.13-4.

The level of service analysis for the No Project scenario is shown in Table 4.13-11. Existing lane geometry and intersection configurations shown in Figure 4.13-2 were assumed in this analysis. The level of service calculations are provided in Appendix D, which is available for review at the City of Lafayette. The City currently participates in the Lamorinda Fee and Finance Authority's Transportation Mitigation Fee Program. The 1998 Lamorinda Nexus Study prepared in 1998 outlines planned improvements under this nexus program.

As shown in Table 4.13-11, all of the signalized study area intersections would operate at an acceptable LOS D or better except the following four intersections:

- **Mount Diablo Boulevard/Moraga Road:** LOS E during the PM peak hour. The intersection would operate at an acceptable LOS D during the AM and mid-day peak periods based on the overall average delay at the intersection, which determines the level of service. However, it should be noted that northbound traffic on Moraga Road approaching the intersection to turn left onto Mount Diablo Boulevard or continue through



Source: TJKM

FIGURE 4.13-4

CUMULATIVE NO PROJECT PEAK HOUR TURNING MOVEMENT VOLUMES

TABLE 4.13-11 **CUMULATIVE NO PROJECT INTERSECTION LEVEL OF SERVICE (HCM METHODOLOGY)**

	AM Peak		Midday Peak[a]		PM Peak	
Intersections	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**
Signalized Intersections						
1. Mt. Diablo Boulevard/Acalanes Road/SR 24 EB Ramps	B	12.4	B	9.6	B	9.9
2. Mt. Diablo Boulevard/Risa Road/Village Center	A	10.0	B	10.4	B	11.4
3. Mt. Diablo Boulevard/Dolores Drive/Mtn. View Drive	B	12.3	B	14.4	B	17.8
4. Mt. Diablo Boulevard/Happy Valley Road	C	25.4	C	30.1	D	40.2
5. Mt. Diablo Boulevard/Dewing Avenue	B	11.9	B	16.2	B	16.0
6. Mt. Diablo Boulevard/Lafayette Circle (west)	A	6.1	B	11.3	A	7.4
7. Mt. Diablo Boulevard/Oak Hill Road/Lafayette Circle (east)	C	34.1	D	43.2	D	46.6
8. Mt. Diablo Boulevard/Moraga Road	**D**	**44.8**	**D**	**50.8**	**E**	**55.7**
9. Mt. Diablo Boulevard/First Street	C	33.1	D	38.6	D	39.8
10. Mt. Diablo Boulevard/Second Street	B	10.7	A	9.8	A	8.4
11. Mt. Diablo Boulevard/Brown Avenue/Almanor Lane	B	14.2	B	12.1	B	11.4
12. Mt. Diablo Boulevard/Carol Lane	A	7.9	A	9.0	A	9.3
13. Mt. Diablo Boulevard/Lafayette Park Hotel	A	4.5	A	4.4	A	4.8
14. Mt. Diablo Boulevard/Pleasant Hill Road/SR 24 EB On-Ramp	B	17.6	B	16.7	B	15.5
15. Pleasant Hill Road/SR 24 EB Off-Ramp/Old Tunnel Road	B	15.3	B	14.8	B	15.7
16. Moraga Road/Moraga Boulevard	A	4.6	A	5.3	A	3.3
17. Moraga Road/Brook Street	**C**	**20.8**	**E**	**61.4**	**C**	**33.8**
18. Moraga Road/School Street	**F**	**166.5**	**F**	**225.8**	**F**	**104.8**
19. Moraga Road/St. Mary's Road	C	23.3	B	17.5	C	20.9
23. Deer Hill Road/SR 24 WB Ramps/Laurel Drive	**E**	**60.5**	**D**	**40.3**	**E**	**63.4**
24. Deer Hill Road/First Street/Sierra Vista Way	B	15.3	B	13.9	C	24.7
Unsignalized Intersections						
20. Oak Hill Road/SR 24 EB Off-Ramp (Stop sign on Off-Ramp)	C	16.3	C	22.2	D	32.3
21. Deer Hill Road/Happy Valley Road (3-way Stop)	**F**	**77.6**	**D**	**31.6**	**E**	**40.3**
22. Deer Hill Road/Oak Hill Road (4-way Stop)	**D**	**28.7**	**C**	**17.7**	**E**	**36.8**
25. First Street/SR 24 EB On-Ramp (Left turn yields)	**A**	**4.9**	**B**	**10.4**	**F**	**83.0**

[a] Mid-day peak results reported for the 2:15 to 3:15 PM school commute traffic period.
Notes: Rows in bold indicate intersections operating at an unacceptable LOS. Intersections 2 through 12, and 16, 17, and 18 are Downtown intersections, which have a different level of service threshold than intersections outside the downtown area, per General Plan definitions.
Source: TJKM, 2009.

the intersection would experience average delays of more than a minute during all three peak periods.

- **Moraga Road/School Street**: LOS F during the AM, mid-day, and PM peak hours.
- **Moraga Road/Brook Street:** LOS E during the mid-day peak hour. Although the AM and PM peak hour level of service grades would be acceptable for this intersection, it would be severely affected by both queue spillover and constrained traffic flow from the LOS F conditions at the immediately adjacent Moraga Road/School Street intersection during all three peak hours.
- **Deer Hill Road/State Route 24 Westbound Ramps:** LOS E during the AM and PM peak hours.

Three of the four unsignalized study intersections would operate at an unacceptable level of service during at least one of the peak hours:

- **Deer Hill Road/Happy Valley Road:** LOS F during the AM peak hour and LOS E during the PM peak hour.
- **Deer Hill Road/Oak Hill Road:** LOS E during the PM peak hour.
- **First Street/State Route 24 Eastbound On-Ramp:** LOS F for the southbound left turn to the freeway on-ramp during the PM peak hour.

For the routes of regional significance, the CCTA traffic model was used for 2030 forecasts, assuming buildout of the Lafayette General Plan. Delay Indexes on State Route 24 and Pleasant Hill Road north of State Route 24 during the AM and PM peak hours were determined for the Cumulative No Project scenario. The Delay Index measures travel congestion and is expressed as the ratio of time required to travel between two points during the peak hour (the congested travel time) versus the time required during uncongested off-peak times. A Delay Index of 2.0, which is the acceptable standard of significance for State Route 24 and Pleasant Hill Road north of State Route 24, means that congested travel time is twice as long as during an off-peak travel time.

The Delay Indexes in the Cumulative No Project scenario, summarized in Table 4.13-12, were calculated during the AM and PM peak hours on State Route 24 in both the eastbound and westbound direction between St. Stephens Drive and Interstate 680. As noted in the table, State Route 24 will operate with an unacceptable Delay Index of over 2.0 for westbound traffic in the AM peak hour and eastbound traffic in the PM peak hour under the Cumulative No Project scenario.

For Pleasant Hill Road in both the northbound and southbound direction between State Route 24 and Taylor Boulevard, the Delay Indexes in the Cumulative No Project scenario were calculated during the AM and PM peak hours, and are summarized in Table 4.13-13. As noted in the table, Pleasant Hill Road will operate with an unacceptable Delay Index of over 2.0 for southbound traffic in the AM peak hour and northbound traffic in the PM peak hour under the Cumulative No Project scenario.

iii. Cumulative with Specific Plan Project Traffic Operations

a) Cumulative with Specific Plan Project Land Use

The Cumulative with Specific Plan Project scenario assumed buildout in the Plan Area over the 20-year Plan horizon. Land uses that were assumed to develop in the Plan Area are summarized in Table 4.13-14.

b) Trip Generation

Daily and peak hour trips that would be attributed to land uses developed under the Plan, as shown in Table 4.13-14, are based on the ITE *Trip Generation, 8th Edition*, and include adjustments that reflect mixed-use, transit-oriented development, and retail pass-by trips as described in Section 4.a.i.

c) Cumulative with Specific Plan Project Traffic Operations

Trips associated with buildout of the Plan were input into the Cumulative TRAFFIX model. Cumulative with Specific Plan Project peak hour intersection volumes are shown in Figure 4.13-5.

TABLE 4.13-12 **CUMULATIVE NO PROJECT DELAY INDEX – STATE ROUTE 24 BETWEEN ST. STEPHENS DRIVE AND INTERSTATE 680**

	2030 Volume		Travel Time (Minutes)		Delay Index	
Peak Hour	East-bound	West-bound	East-bound	West-bound	East-bound	West-bound
AM	8,900	11,900	7.7	18.6	1.51	3.50
PM	11,900	9,800	20.5	9.8	4.00	1.85

Source: TJKM, 2009.

TABLE 4.13-13 **CUMULATIVE NO PROJECT DELAY INDEX – PLEASANT HILL ROAD BETWEEN STATE ROUTE 24 AND TAYLOR BOULEVARD**

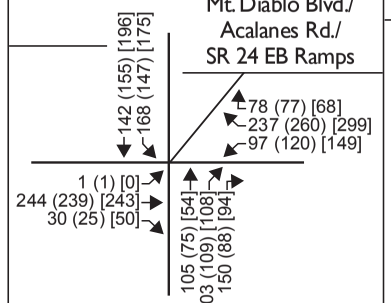
	2030 Volume		Travel Time (Minutes)		Delay Index	
Peak Hour	North-bound	South-bound	North-bound	South-bound	North-bound	South-bound
AM	1,830	2,630	2.7	9.8	0.95	3.39
PM	2,830	2,350	11.1	5.7	3.84	1.97

Source: TJKM, 2009.

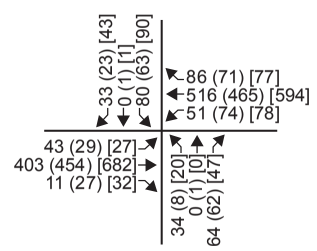
Table 4.13-15 summarizes levels of service for each of the study intersections for the Cumulative with Specific Plan Project scenario, and provides a comparative summary of level of service under the Cumulative No Project scenario. The level of service analysis is based on the existing lane geometry and intersection configurations shown in Figure 4.13-2. Level of service calculations are provided in Appendix D, which is available for review at the City of Lafayette.

As shown in Table 4.13-15, under cumulative conditions with the addition of the traffic associated with buildout of the Plan, all of the signalized study area

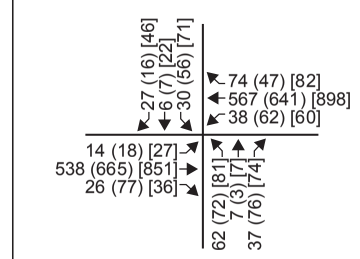
Intersection #1
Mt. Diablo Blvd./
Acalanes Rd./
SR 24 EB Ramps



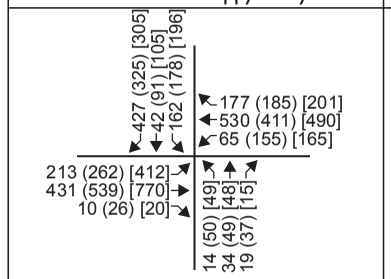
Intersection #2
Mt. Diablo Blvd./Risa Rd./Village Center



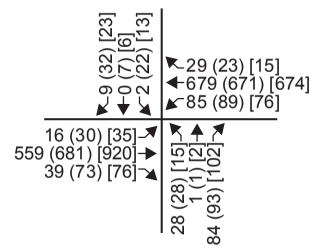
Intersection #3
Mt. Diablo Blvd./Dolores Dr./Mtn.View Dr.



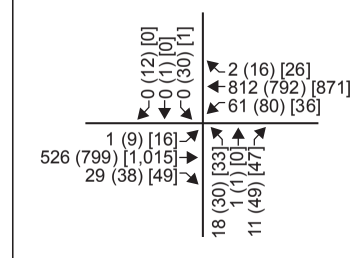
Intersection #4
Mt. Diablo Blvd./Happy Valley Rd.



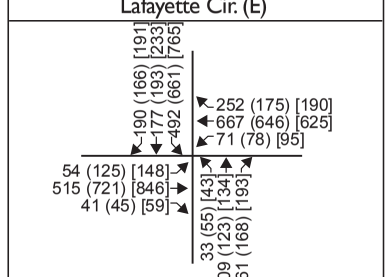
Intersection #5
Mt. Diablo Blvd./Dewing Ave.



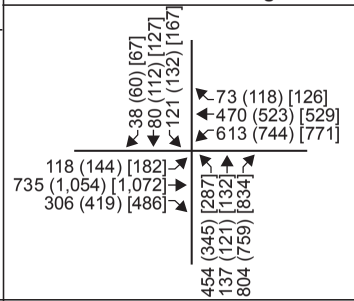
Intersection #6
Mt. Diablo Blvd./Lafayette Cir. (W)



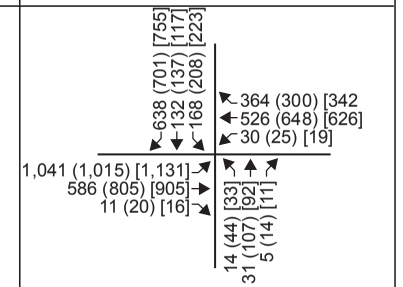
Intersection #7
Mt. Diablo Blvd./Oak Hill Rd./
Lafayette Cir. (E)



Intersection #8
Mt. Diablo Blvd./Moraga Rd.



Intersection #9
Mt. Diablo Blvd./First St.

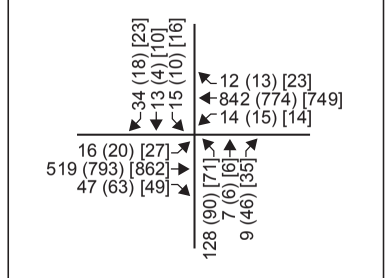


LEGEND

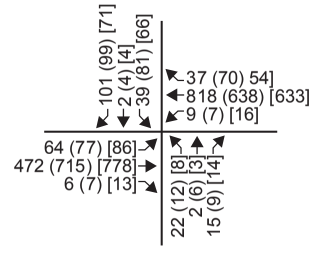
- ● Study Intersection
- XX AM Peak Hour Volumes
- (XX) Midday Peak Hour Volumes
- [XX] PM Peak Hour Volumes

NORTH
Not to Scale
TJKM

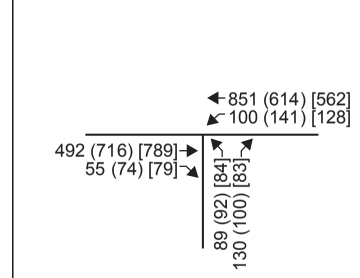
Intersection #10
Mt. Diablo Blvd./Second St.



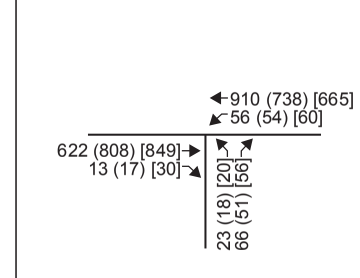
Intersection #11
Mt. Diablo Blvd./Brown Ave./Almanor Ln.



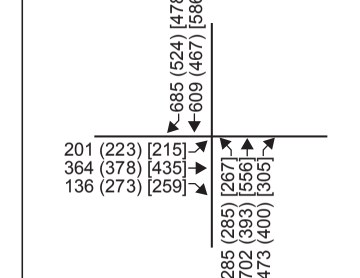
Intersection #12
Mt. Diablo Blvd./Carol Ln.



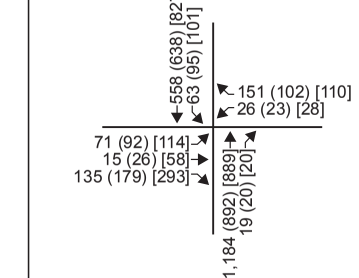
Intersection #13
Mt. Diablo Blvd./Lafayette Park Hotel



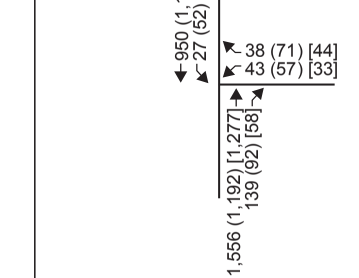
Intersection #14
Mt. Diablo Blvd./Pleasant Hill Rd./
SR 24 EB On-Ramp



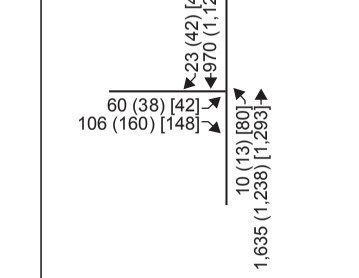
Intersection #15
Pleasant Hill Rd./SR 24 EB Off-Ramp/
Old Tunnel Rd.



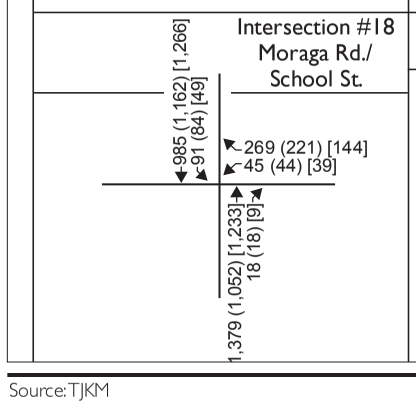
Intersection #16
Moraga Rd./
Moraga Blvd.



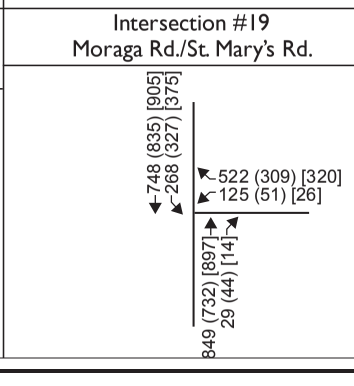
Intersection #17
Moraga Rd./
Brook St.



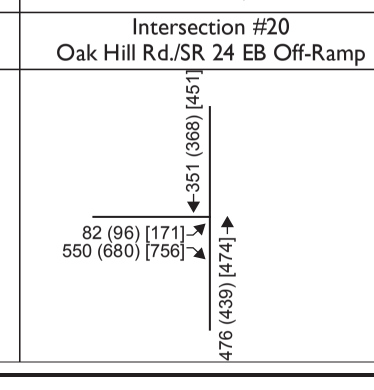
Intersection #18
Moraga Rd./
School St.



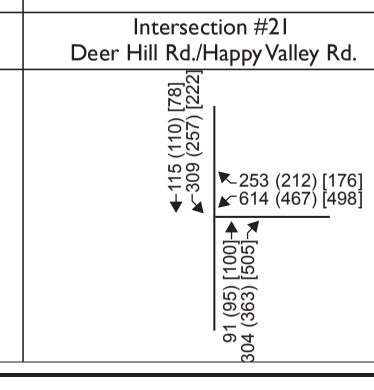
Intersection #19
Moraga Rd./St. Mary's Rd.



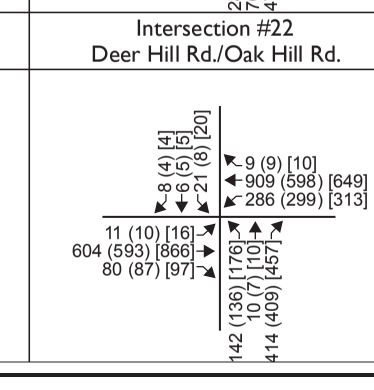
Intersection #20
Oak Hill Rd./SR 24 EB Off-Ramp



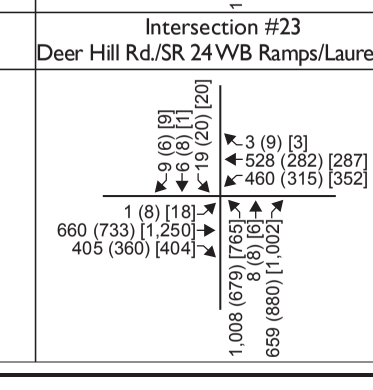
Intersection #21
Deer Hill Rd./Happy Valley Rd.



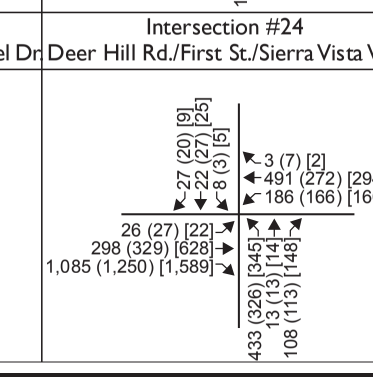
Intersection #22
Deer Hill Rd./Oak Hill Rd.



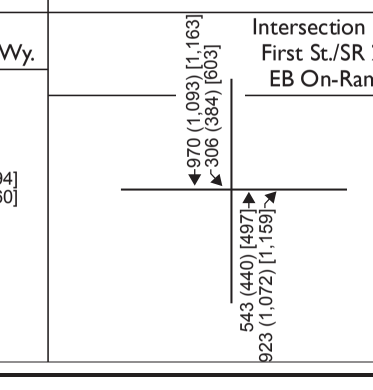
Intersection #23
Deer Hill Rd./SR 24 WB Ramps/Laurel Dr



Intersection #24
Deer Hill Rd./First St./Sierra Vista Wy.



Intersection #25
First St./SR 24
EB On-Ramp



Source: TJKM

FIGURE 4.13-5

CUMULATIVE WITH SPECIFIC PLAN PROJECT PEAK HOUR TURNING MOVEMENT VOLUMES

TABLE 4.13-14 **PLAN TRIP GENERATION**

				Trip Generation								
				AM Peak Hour			Mid-Day Peak			PM Peak Hour		
Land Use Type[a]	Quantity[b]	Units	Daily Total	Total	In	Out	Total	In	Out	Total	In	Out
Retail[c]	180	KSF	6,567	173	105	68	551	303	248	449	220	229
Office[d]	180	KSF	1,701	256	226	30	73	30	43	236	40	196
Residential[e]	1,765	DU	11,081	1,072	268	804	848	407	441	1,193	692	501
Total			**19,349**	**1,501**	**599**	**902**	**1,472**	**740**	**732**	**1,878**	**952**	**926**

KSF = thousands of square feet; DU = dwelling units
Note: Trip generation rates are based on Institute of Transportation Engineers *Trip Generation (8th Edition)*, as modified to reflect transit use, mixed-use internal interaction, and retail pass-by trips.
[a] General Plan land uses.
[b] Land use intensity (number of units).
[c] Shopping Center (ITE Code 820).
[d] General Office Building (ITE Code 710).
[e] Low-Rise Residential Condominium (ITE Code 231).
Source: TJKM, 2009.

TABLE 4.13-15 **CUMULATIVE WITH SPECIFIC PLAN PROJECT INTERSECTION LEVEL OF SERVICE (HCM METHODOLOGY)**

	AM Peak		Mid-Day Peak[a]		PM Peak	
Intersections	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**
Signalized Intersections						
1. Mt. Diablo Boulevard/Acalanes Road/SR 24 EB Ramps	B	12.6	B	9.6	B	10.0
2. Mt. Diablo Boulevard/Risa Road/Village Center	A	10.0	B	10.5	B	11.2
3. Mt. Diablo Boulevard/Dolores Drive/Mtn. View Drive	B	12.1	B	14.4	B	18.0
4. Mt. Diablo Boulevard/Happy Valley Road	C	27.2	C	32.5	D	45.4
5. Mt. Diablo Boulevard/Dewing Avenue	B	11.6	B	15.9	B	15.6
6. Mt. Diablo Boulevard/Lafayette Circle (west)	A	5.8	B	14.0	A	7.3
7. Mt. Diablo Boulevard/Oak Hill Road/Lafayette Circle (east)	**C**	**36.5**	**D**	**46.3**	**E**	**55.0**
8. Mt. Diablo Boulevard/Moraga Road	**E**	**55.8**	**E**	**59.5**	**E**	**66.2**
9. Mt. Diablo Boulevard/First Street	D	36.0	D	41.6	D	45.2
10. Mt. Diablo Boulevard/Second Street	B	10.2	A	9.7	A	7.9
11. Mt. Diablo Boulevard/Brown Avenue/Almanor Lane	B	12.5	B	12.0	B	11.6
12. Mt. Diablo Boulevard/Carol Lane	A	7.9	A	8.9	A	9.3
13. Mt. Diablo Boulevard/Lafayette Park Hotel	A	5.5	A	5.6	A	5.8
14. Mt. Diablo Boulevard/Pleasant Hill Road/SR 24 EB On-Ramp	B	19.6	C	22.4	B	19.7
15. Pleasant Hill Road/SR 24 EB Off-Ramp/Old Tunnel Road	B	15.5	C	15.0	B	15.9
16. Moraga Road/Moraga Boulevard	A	4.7	A	5.4	A	3.3
17. Moraga Road/Brook Street	**C**	**26.9**	**E**	**68.5**	**D**	**45.6**
18. Moraga Road/School Street	**F**	**194.5**	**F**	**247.2**	**F**	**130.7**
19. Moraga Road/St. Mary's Road	C	24.5	B	18.4	C	22.5
23. Deer Hill Road/SR 24 WB Ramps/Laurel Drive	**E**	**69.2**	**D**	**47.1**	**E**	**77.0**
24. Deer Hill Road/First Street/Sierra Vista Way	**B**	**15.8**	**B**	**15.6**	**E**	**57.2**
Unsignalized Intersections						
20. Oak Hill Road/SR 24 EB Off-Ramp (Stop sign on Off-Ramp)	**C**	**18.5**	**D**	**30.0**	**F**	**59.2**
21. Deer Hill Road/Happy Valley Road (3-way Stop)	**F**	**94.6**	**E**	**42.5**	**F**	**61.8**
22. Deer Hill Road/Oak Hill Road (4-way Stop)	**D**	**34.5**	**C**	**20.0**	**E**	**47.9**
25. First Street/SR 24 EB On-Ramp (Left turn yields)	**A**	**8.5**	**B**	**19.3**	**F**	**132.5**

[a] Mid-day peak results reported for the 2:15 to 3:15 PM school commute traffic period.
Note: Rows in bold indicate intersections that would operate at an unacceptable level of service. Intersections 2 through 12, and 16, 17, and 18 are Downtown intersections, which have a different level of service threshold than intersections outside the downtown area, per General Plan definitions.
Source: TJKM, 2009.

intersections would operate at an acceptable LOS D or better except the following six intersections:

- **Mount Diablo Boulevard/Oak Hill Road/Lafayette Circle East:** LOS E during the PM peak hour.
- **Mount Diablo Boulevard/Moraga Road:** LOS E during the AM, mid-day, and PM peak hours.
- **Moraga Road/School Street**: LOS F during the AM, mid-day, and PM peak hours.
- **Moraga Road/Brook Street:** LOS E during the mid-day peak hour. Although the AM and PM peak hour level of service grades would be acceptable for this intersection, it would be severely affected by both queue spillover and constrained traffic flow from the LOS F conditions at the immediately adjacent Moraga Road/School Street intersection during all three peak hours.
- **Deer Hill Road/State Route 24 Westbound Ramps:** LOS E during the AM and PM peak hours, and "poor" LOS D during the mid-day peak hour.
- **Deer Hill Road/First Street:** LOS E during the PM peak hour.

All four of the unsignalized study intersections would operate at an unacceptable level of service during at least one of the peak hours:

- **Oak Hill Road/State Route 24 Eastbound Off-Ramp:** LOS F for the stop-controlled eastbound traffic on the off-ramp during the PM peak hour.
- **Deer Hill Road/Happy Valley Road:** LOS F during the AM and PM peak hours, and LOS E during the mid-day peak hour.
- **Deer Hill Road/Oak Hill Road:** LOS E during the PM peak hour.
- **First Street/State Route 24 Eastbound On-Ramp:** LOS F for the southbound left turn to the freeway on-ramp during the PM peak hour.

For each of these intersections, levels of service under Cumulative with Specific Plan Project conditions would deteriorate to unacceptable levels and therefore the project-related impacts to level of service would be considered *significant*.

Delay Indexes on the State Route 24 freeway and Pleasant Hill Road north of State Route 24 during the AM and PM peak hours were determined for the Cumulative with Specific Plan Project scenario. The additional trips generated by the Plan for this analysis of the routes of regional significance were added to traffic forecasts from the CCTA traffic model for year 2030, which assume future development as it would occur under existing General Plan designations.

The Delay Indexes in the Cumulative with Specific Plan Project scenario were calculated during the AM and PM peak hours on State Route 24 in both the eastbound and westbound direction between St. Stephens Drive and Interstate 680, and are summarized in Table 4.13-16. As noted in the table, State Route 24 will operate with an unacceptable Delay Index of over 2.0 for westbound traffic in the AM peak hour and eastbound traffic in the PM peak hour under the Cumulative with Specific Plan Project scenario.

For Pleasant Hill Road in both the northbound and southbound direction between State Route 24 and Taylor Boulevard, the Delay Indexes in the Cumulative with Specific Plan Project scenario were calculated during the AM and PM peak hours, and are summarized in Table 4.13-17. As noted in the table, Pleasant Hill Road will operate with an unacceptable Delay Index of over 2.0 for southbound traffic in the AM peak hour and both northbound and southbound traffic in the PM peak hour under the Cumulative with Specific Plan Project scenario.

For each of these roadways, the project-related impacts to the Delay Index would be considered *significant*.

TABLE 4.13-16 **CUMULATIVE WITH SPECIFIC PLAN PROJECT DELAY INDEX – STATE ROUTE 24 BETWEEN ST. STEPHENS DRIVE AND INTERSTATE 680**

	2030 Volume		Travel Time (Minutes)		Delay Index	
Peak Hour	East-bound	West-bound	East-bound	West-bound	East-bound	West-bound
AM	9,100	12,000	8.3	18.9	1.63	3.56
PM	12,100	10,000	21.1	10.4	4.12	1.97

Source: TJKM, 2009.

TABLE 4.13-17 **CUMULATIVE WITH SPECIFIC PLAN PROJECT DELAY INDEX – PLEASANT HILL ROAD BETWEEN STATE ROUTE 24 AND TAYLOR BOULEVARD**

	2030 Volume		Travel Time (Minutes)		Delay Index	
Peak Hour	North-bound	South-bound	North-bound	South-bound	North-bound	South-bound
AM	1,850	2,650	3.0	10.1	1.05	3.49
PM	2,850	2,390	11.4	6.3	3.94	2.18

Source: TJKM, 2009.

c. Future Improvements

i. Oak Hill Road/Mount Diablo Boulevard

Project traffic would cause this intersection to degrade below acceptable levels of service in the PM peak period. Based on an analysis of the intersection operations, Oak Hill Road should be restriped to include two southbound left-turn-only lanes at this intersection in the future, revising the existing configuration of one left-only, one shared left-through, and one right-only lane. To safely accommodate southbound through traffic on its offset path to La-

fayette Circle East, it is recommended that such through traffic should continue to use the same lane that it currently shares with left turns, and that a fourth southbound lane be added on Oak Hill Road, to provide two left-turn-only lanes, one through lane, and one right-turn lane. This can be accomplished by restriping to reduce the very wide northbound curb lane on Oak Hill Road to a standard width and shift the two northbound lanes toward the east curb, creating room for the additional southbound lane. Shifting the northbound lanes could result in the loss of up to six curb parking spaces along the east curb on Oak Hill Road.

The City should monitor the intersection and restripe Oak Hill Road at such time that the intersection approaches unacceptable LOS E operations. Development projects within the Plan Area should be 100 percent responsible for the funding of this mitigation.

ii. Moraga Road/Mount Diablo Boulevard

The level of service for the Cumulative with Specific Plan Project scenario would be an acceptable "poor" LOS D in the AM, mid-day, and PM peak hours based on the overall average delay at the intersection, which determines the level of service. However, northbound traffic on Moraga Road approaching the intersection to turn left onto Mount Diablo Boulevard or continue through the intersection would still experience average delays of more than a minute during all three peak periods. To reduce the impact on the Moraga Road/Mount Diablo Boulevard intersection, a second northbound right-turn lane would be required.

Widening Moraga Road to add the second northbound right-turn lane would require substantial reconstruction of the sidewalk, landscaping, and structural elements of Plaza Park along the east curb area, and result in a reduction of the usable recreation and community activity area at the Park. In addition, the resulting easterly shift of the southeast corner of the intersection would increase the crossing distance for pedestrians crossing Mount Diablo Boulevard or Moraga Road to or from that corner.

The secondary impacts of the widening could be considered unacceptably inconsistent with City policies regarding pedestrian convenience, recreation and civic area, and landscaping, which could prevent implementation of the widening.

iii. Moraga Road/School Street

The level of service at the Moraga Road/School Street intersection would be LOS F in the Cumulative No Project and Cumulative with Specific Plan Project conditions, but the delay would deteriorate enough to create a significant impact during the AM, mid-day, and PM peak periods. The intersection of Moraga Road/Brook Street would operate at LOS E during the mid-day peak in the Cumulative No Project and Cumulative with Specific Plan Project conditions, but the delay would deteriorate enough to cause a significant impact. Additionally, although the AM and PM peak hour level of service grades would be acceptable for the Brook Street intersection, it would be severely impacted by both queue spillover and constrained traffic flow from the LOS F conditions at the immediately adjacent Moraga Road/School Street intersection during all three peak hours.

iv. Moraga Road between School Street and Moraga Boulevard

To reduce impacts to less-than-significant levels, a center left-turn lane should be added on Moraga Road between School Street and Moraga Boulevard. The center left-turn lane would be used by southbound Moraga Road traffic turning left at School Street or at Lafayette Elementary School. This would leave two lanes open for southbound through traffic, in contrast to the existing condition where one of the two southbound lanes is blocked by left-turn traffic. Westbound traffic on School Street approaching the intersection with Moraga Road would experience average delays of approximately one minute during the AM and mid-day peak periods.

Adding a center left-turn lane on this portion of Moraga Road would require narrowing all lanes to approximately 10-foot widths, eliminating existing striped shoulders between traffic lanes and curbs, and eliminating existing parking along the west curb. The resulting five-lane configuration would

shift vehicle traffic lanes to immediately alongside the curb and sidewalk, where the sidewalks are generally only 5-feet wide and no landscaping is present to provide a buffer between pedestrians and vehicles. The traffic lanes along the curb would not be wide enough for a motor vehicle and a bicycle to travel safely side-by-side. These conditions would be especially problematic in the narrow roadway segment between School Street and Brook Street, where the traffic lane along the curb would need to be particularly narrow, alongside a mere 4-foot sidewalk on the west side. Although the east sidewalk is 8 feet wide, it serves a high volume of pedestrians for the immediately adjacent Lafayette Elementary School and nearby Stanley Middle School.

The secondary impacts of adding a center left-turn lane could be considered unacceptably inconsistent with City engineering standards for lane widths, and policies regarding pedestrian and bicycle safety and convenience, which could prevent implementation.

v. Deer Hill Road/State Route 24 Westbound Ramps

Buildout of the Plan would result in increases in traffic volumes such that: the intersection of Deer Hill Road and State Route 24 Westbound Ramps would deteriorate from "good" LOS D to "poor" LOS D in the mid-day peak hour, and the LOS E delay would increase in the AM and PM peak hours; and, the intersection of Deer Hill Road and First Street would deteriorate from LOS C to LOS E in the PM peak hour.

Deer Hill Road should be restriped to include three eastbound through lanes at the State Route 24 westbound ramps intersection in the future, revising the existing configuration of one left-turn, two through, and one right-turn lane. This can be accomplished by restriping to eliminate the existing striped right shoulder area and shift the right-turn lane toward the south curb, creating room for the additional eastbound through lane. To accommodate the additional lane continuing eastbound through the intersection, the north end of the median on the State Route 24 westbound ramps must be removed, and Deer Hill Road must be widened by up to five feet along the south curb between the State Route 24 ramps and First Street, where the adjacent property

is currently vacant. Then, as the additional eastbound lane approaches First Street, it would become a second right-turn lane, providing one left-turn lane, one through lane, and two right-turn lanes on eastbound Deer Hill Road at First Street. The two eastbound right-turn lanes would be controlled by a modified traffic signal at Deer Hill Road/First Street, replacing the uncontrolled free right-turn from the existing single lane. However, the vacant property on the south side of Deer Hill Road between the off-ramp and First Street is proposed to be developed, and the suggested widening for an additional eastbound lane may not be feasible within the context of that development.

Further improvement could be achieved by adding a second westbound left-turn lane on westbound Deer Hill Road approaching the State Route 24 westbound ramps intersection, in addition to the eastbound lane additions identified above.

The levels of service for the Cumulative with Specific Plan Project scenario with the additional eastbound lane would be as follows.

- Deer Hill Road and State Route 24 westbound ramps:
  - In the AM peak hour, the intersection would operate at an unacceptable LOS E with 55.0 seconds of delay, which is an improvement over the 60.5 seconds of LOS E delay for the Cumulative No Project (without mitigation) scenario.
  - Acceptable "good" LOS D in the mid-day peak hour.
  - In the PM peak hour, the intersection would operate at an unacceptable "poor" LOS D with 54.7 seconds of delay, which is an improvement over the LOS E operations for the Cumulative No Project (without mitigation) scenario.
- Deer Hill Road and First Street: LOS C during AM, mid-day, and PM peak hours.

With the second westbound left-turn lane on westbound Deer Hill Road approach at the State Route 24 westbound ramps, for the Cumulative with Specific Plan Project scenario, the intersection would operate at acceptable levels of LOS C in the mid-day peak hour and "good" LOS D in the PM peak hour. In the AM peak hour, the intersection would still operate at an unacceptable "poor" LOS D with 46.0 seconds of delay, which would be an additional improvement over the LOS E operations for the Cumulative No Project (without mitigation) scenario, and the delay would be slightly reduced from the existing "poor" LOS D operation of 46.5 seconds of delay.

Adding a second westbound left-turn lane on Deer Hill Road approaching the State Route 24 westbound Ramps would require narrowing all westbound lanes to approximately 10-foot to 11-foot widths, and eliminating the existing westbound striped bicycle lane along the north curb. The resulting four-lane westbound configuration would shift vehicle traffic lanes to be immediately alongside the curb and sidewalk, where the sidewalks are generally only five feet wide and no landscaping is present to provide a buffer between pedestrians and vehicles. The traffic lane along the curb would not be wide enough for a motor vehicle and a bicycle to travel safely side-by-side. The secondary impacts of adding a second westbound left-turn lane could be considered inconsistent with City engineering standards for lane widths, and policies regarding pedestrian and bicycle safety and convenience, including City and County bicycle plans; this inconsistency could prevent implementation. Therefore, this additional mitigation is not recommended.

vi. Oak Hill Road/State Route 24 Eastbound Off-Ramp

Buildout of the Plan would result in increases in traffic volumes such that the intersection of Oak Hill Road and the State Route 24 eastbound off-ramp would deteriorate from LOS D to LOS F for the stop-controlled eastbound traffic on the off-ramp in the PM peak hour. This would be a *significant* impact.

Based on a preliminary signal warrant analysis (Peak Hour Volume Warrant), a traffic signal should be installed at the intersection of Oak Hill Road/State

Route 24 eastbound off-ramp. The City should monitor the intersection and install the traffic signal at such time that signal warrants are met.

The level of service for the Cumulative with Specific Plan Project scenario with signalization would be LOS B or better.

vii. Deer Hill Road/Happy Valley Road

Buildout of the Plan would result in increases in traffic volumes such that the intersection of Deer Hill Road and Happy Valley Road would deteriorate from LOS D to LOS E in the mid-day peak hour.

The intersection operates at LOS F during the AM peak hour in the Existing, Cumulative No Project, and Cumulative with Specific Plan Project conditions, but the delay would deteriorate enough to create a significant impact. The intersection would also operate at an unacceptable LOS E during the PM peak hour in the Cumulative No Project scenario, but deteriorate to LOS F in the Cumulative with Specific Plan Project scenario to create a significant impact.

Based on a preliminary signal warrant analysis (Peak Hour Volume Warrant), a traffic signal should be installed at the intersection of Deer Hill Road and Happy Valley Road when mid-day or PM peak hour operations deteriorate to LOS E, or as determined by the City of Lafayette.

The City should monitor the intersection and install the traffic signal at such a time that mid-day or PM peak hour operations deteriorate to LOS E, or as determined by the City of Lafayette.

With signalization and the existing lane geometry in the Cumulative No Project scenario, the intersection would operate at an acceptable LOS B. The level of service for the Cumulative with Specific Plan Project scenario with signalization would be a "good" LOS D in the AM peak hour and LOS C in the mid-day and PM peaks.

viii. Deer Hill Road/Oak Hill Road
Buildout of the Plan would result in increases in traffic volumes such that the delay at the intersection of Deer Hill Road and Oak Hill Road would increase. This intersection would operate at LOS E under both the Cumulative No Project and Cumulative with Specific Plan Project conditions, but the delay would deteriorate enough to create a significant impact during the PM peak period.

The City should monitor this intersection and install a traffic signal when warrants are met. Signalization of this intersection is already contemplated in the Lamorinda Nexus Study, and as such, the related impacts would already be mitigated.

With signalization and the existing lane geometry in the Cumulative No Project conditions, this intersection would operate at an acceptable LOS C. The level of service for the Cumulative with Specific Plan Project scenario with signalization would be LOS C.

ix. First Street/State Route 24 Eastbound On-Ramp
Buildout of the Plan would result in increases in traffic volumes such that the delay at the intersection of First Street and the State Route 24 eastbound on-ramp would increase. This intersection would operate at LOS F for southbound traffic turning left onto the freeway on-ramp under both the Cumulative No Project and Cumulative with Specific Plan Project conditions, but the delay deteriorates enough to create a significant impact during the PM peak period.

The City should monitor the intersection and install the traffic signal at such time that PM peak hour operations deteriorate to LOS F for the southbound left turn. Development projects within the Plan Area should contribute a fair share to the funding of this mitigation, as determined by the City of Lafayette.

With signalization and the existing lane geometry in the Cumulative No Project conditions, this intersection would operate at an acceptable LOS B. The level of service for the Cumulative with Specific Plan Project scenario with signalization would be LOS C.

x. State Route 24 Delay Index

Buildout of the Plan would result in increases in traffic volumes such that the Delay Index on the State Route 24 freeway would increase. The State Route 24 freeway would operate at a Delay Index exceeding 2.0 under both the Cumulative No Project and Cumulative with Specific Plan Project conditions, but the delay would deteriorate enough to create a significant impact on westbound traffic during the AM peak hour and eastbound traffic during the PM peak hour.

Constructing the additional capacity needed to mitigate the peak hour/peak direction delay impacts on State Route 24 in the study area, such as additional mainline freeway lanes, etc., would be extremely expensive and disruptive. Caltrans is currently working on a study that may propose high-occupancy vehicle (HOV) lanes on State Route 24. However, the feasibility, schedule, and funding for such a project are unknown at this time, and therefore it is not considered a feasible mitigation. No other capacity expansion project is currently under consideration by the responsible regional transportation agencies.

No feasible mitigations are available to reduce this impact to less-than-significant levels. Therefore, this impact is considered significant and unavoidable.

xi. Pleasant Hill Road Delay Index

Buildout of the Plan would result in increases in traffic volumes such that the Delay Index on southbound Pleasant Hill Road north of State Route 24 would deteriorate from 1.97 to 2.18 in the PM peak hour. Pleasant Hill Road north of State Route 24 would also operate at a Delay Index exceeding 2.0 under both the Cumulative No Project and Cumulative with Specific Plan

Project conditions. Under both scenarios, the delay would deteriorate enough to create a significant impact on southbound traffic during the AM peak hour and northbound traffic during the PM peak hour. Under the Cumulative with Specific Plan Project scenario, the delay would also result in a significant impact during the PM peak hour in the southbound direction.

The Lamorinda Action Plan proposes several measures to address traffic congestion on Pleasant Hill Road. Provision of public transit service in the Pleasant Hill Road/Taylor Boulevard corridor with connections to other transit services in Lafayette is proposed. The Action Plan also suggests measures to meter traffic flow on Pleasant Hill Road to discourage its use to bypass the I-680/SR 24 interchange. Although these measures could reduce traffic volumes and improve the Delay Index somewhat on Pleasant Hill Road, the Delay Index would still exceed the 2.0 threshold and the impact would remain significant.

Constructing the additional capacity needed to mitigate the peak hour delay impacts on Pleasant Hill Road north of State Route 24, such as widening for additional through lanes, etc., would likely be prohibitively expensive and disruptive because of the topography of the roadway alignment, as well as the negative impacts on and the cost to acquire adjacent properties. Additional capacity would also be contrary to the Action Plan measures to meter traffic flow on Pleasant Hill Road. No capacity expanding project is currently under consideration by the responsible regional transportation agencies.

No feasible mitigations are available to reduce this impact to less-than-significant levels. Therefore, this impact is considered significant and unavoidable.

5. Impacts and Mitigation Measures

The following impacts and mitigation measures have been identified with regard to traffic.

Impact TRAF-1: Buildout of the Plan would result in increases in traffic volumes such that the intersection of Mount Diablo Boulevard and Oak Hill Road/Lafayette Circle East would deteriorate from LOS D to LOS E in the PM peak hour. This would be a *significant* impact.

Mitigation Measure TRAF-1: Oak Hill Road should be restriped to provide four southbound lanes, consisting of two left-turn-only lanes, one through lane, and one right-turn lane, approaching its intersection with Mount Diablo Boulevard, when the intersection level of service deteriorates to an unacceptable level.

Significance After Mitigation: The level of service for the Cumulative with Specific Plan Project scenario with the restriping would be a "good" LOS D. Therefore, this impact would be *less than significant* after implementation of this mitigation measure.

Impact TRAF-2: Buildout of the Plan would result in increases in traffic volumes such that the intersection of Mount Diablo Boulevard and Moraga Road would deteriorate from LOS D to LOS E in the AM and mid-day peak hours, and the LOS E delay would increase in the PM peak hour. This would be a *significant* impact.

Mitigation Measure TRAF-2: Widen Moraga Road to add a second northbound right-turn lane approaching its intersection with Mount Diablo Boulevard.

Significance After Mitigation: The improvements needed to reduce the impact to acceptable levels are considered infeasible due to secondary impacts, which were described previously in section A.4.c.ii of this chapter. Therefore this impact is *significant and unavoidable*.

Impact TRAF-3: Buildout of the Plan would result in increases in traffic volumes such that the delays at the intersection of Moraga Road and School Street, and at Moraga Road and Brook Street, would increase. These intersec-

tions would operate at LOS E or F under both the Cumulative No Project and Cumulative with Specific Plan Project conditions. This would be a *significant* impact.

Mitigation Measure TRAF-3: Add a center left-turn lane on Moraga Road between School Street and Moraga Boulevard.

Significance After Mitigation: Adding a center left-turn would provide acceptable levels of service at the Moraga Road/School Street and Moraga Road/Brook Street intersections for the Cumulative with Specific Plan Project scenario in the AM, mid-day, and PM peak hours. However, secondary impacts, which were described previously in section A.4.c.iv of this chapter, make this improvement result in a *significant and unavoidable* impact.

Impact TRAF-4: Buildout of the Plan would result in increases in traffic volumes such that: the intersection of Deer Hill Road and State Route 24 Westbound Ramps would deteriorate from "good" LOS D to "poor" LOS D in the mid-day peak hour, and the LOS E delay would increase in the AM and PM peak hours; and, the intersection of Deer Hill Road and First Street would deteriorate from LOS C to LOS E in the PM peak hour. This would be a *significant* impact.

Mitigation Measure TRAF-4: Re-stripe Deer Hill Road to add a third eastbound through lane approaching its intersection with the State Route 24 Westbound ramps, and widen Deer Hill Road to add a second eastbound right-turn lane approaching its intersection with First Street.

The Lamorinda Nexus Study should be revised to include this improvement, if the widening of Deer Hill Road is feasible within the context of proposed development of the adjacent vacant lot.

Significance After Mitigation: Because this mitigation would not bring levels of service to acceptable levels for the AM and PM peak hours, and

may not be feasible because of the property constraints of the required widening, this impact would be *significant and unavoidable*.

Impact TRAF-5: Buildout of the Plan would result in increases in traffic volumes such that the intersection of Oak Hill Road and the State Route 24 eastbound off-ramp would deteriorate from LOS D to LOS F for the stop-controlled eastbound traffic on the off-ramp in the PM peak hour. This would be a *significant* impact.

Mitigation Measure TRAF-5: Based on a preliminary signal warrant analysis (Peak Hour Volume Warrant), a traffic signal should be installed at the intersection of Oak Hill Road/ State Route 24 eastbound off-ramp. The City should monitor the intersection and install the traffic signal at such time that signal warrants are met.

The Lamorinda Nexus Study should be revised to include this improvement.

Significance After Mitigation: The level of service for the Cumulative with Specific Plan Project scenario with signalization would be LOS B or better. Therefore, this impact would be *less than significant*.

Impact TRAF-6: Buildout of the Plan would result in increases in traffic volumes such that the intersection of Deer Hill Road and Happy Valley Road would deteriorate from LOS D to LOS E in the mid-day peak hour. This would be a *significant* impact.

Mitigation Measure TRAF-6: Install a traffic signal when determined necessary by the City, but no later than when either mid-day or PM peak hour operations deteriorate to LOS E. The Lamorinda Nexus Study should be revised to include this improvement.

Significance After Mitigation: *Less than significant*.

Impact TRAF-7: Buildout of the Plan would result in increases in traffic volumes such that the delay at the intersection of Deer Hill Road and Oak Hill Road would increase. This intersection would operate at LOS E under both the Cumulative No Project and Cumulative with Specific Plan Project conditions, but the delay would deteriorate enough to create a significant impact during the PM peak period. This would be a *significant* impact.

Mitigation Measure TRAF-7: A traffic signal should be installed at the intersection of Deer Hill Road and Oak Hill Road when warranted.

The City should monitor this intersection and install a traffic signal when warrants are met. Signalization of this intersection is already contemplated in the Lamorinda Nexus Study, and as such, the related impacts would already be mitigated.

Significance After Mitigation: The level of service for the Cumulative with Specific Plan Project scenario with signalization would be LOS C. Therefore, this impact would be *less than significant*.

Impact TRAF-8: Buildout of the Plan would result in increases in traffic volumes such that the delay at the intersection of First Street and the State Route 24 eastbound on-ramp would increase. This intersection would operate at LOS F for southbound traffic turning left onto the freeway on-ramp under both the Cumulative No Project and Cumulative with Specific Plan Project conditions, but the delay deteriorates enough to create a significant impact during the PM peak period. This would be a *significant* impact.

Mitigation Measure TRAF-8: Install a traffic signal to protect southbound left turns when PM peak hour operations deteriorate to LOS F for the left turn movement. The Lamorinda Nexus Study should be revised to include this improvement.

Significance After Mitigation: The level of service for the Cumulative with Specific Plan Project scenario with signalization would be LOS C. Therefore, this impact would be *less than significant*.

Impact TRAF-9: Buildout of the Plan would result in increases in traffic volumes such that the Delay Index on the State Route 24 freeway would increase. The State Route 24 freeway would operate at a Delay Index exceeding 2.0 under both the Cumulative No Project and Cumulative with Specific Plan Project conditions, but the delay would deteriorate enough to create a significant impact on westbound traffic during the AM peak hour and eastbound traffic during the PM peak hour. This would be a *significant* impact.

Mitigation Measure TRAF-9: No feasible mitigation are available to reduce this impact to less-than-significant levels.

Significance After Mitigation: *Significant and unavoidable*.

Impact TRAF-10: Buildout of the Plan would result in increases in traffic volumes such that the Delay Index on southbound Pleasant Hill Road north of State Route 24 would deteriorate from 1.97 to 2.18 in the PM peak hour. Pleasant Hill Road north of State Route 24 would also operate at a Delay Index exceeding 2.0 under both the Cumulative No Project and Cumulative with Specific Plan Project conditions. Under both scenarios, the delay would deteriorate enough to create a significant impact on southbound traffic during the AM peak hour and northbound traffic during the PM peak hour. Under the Cumulative with Specific Plan Project scenario, the delay would also result in a significant impact during the PM peak hour in the southbound direction. This would be a *significant* impact.

Mitigation Measure TRAF-10: No feasible mitigations are available to reduce this impact to less than significant levels.

Significance After Mitigation: *Significant and unavoidable*.

B. Transit, Pedestrian, and Bike Facilities

This section describes existing conditions with regard to transit, pedestrian, and bicycle facilities within the Plan Area, and examines the effects of the Plan on those facilities based on relevant significance criteria.

1. Regulatory Framework

Goals and policies concerning alternative transportation modes are included in the Circulation Element of the Lafayette General Plan. Relevant goals and policies are contained in Table 4.13-18.

2. Existing Conditions

a. Public Transportation

Downtown Lafayette is served by public transit systems, including both local bus and Bay Area Rapid Transit (BART) regional rail service. Each of these services is described below.

i. BART

The Plan Area includes the Lafayette BART Station, located in the median of State Route 24 and at the northern boundary of the BART Block/Town Center in the Downtown Retail District. The Pittsburg/Bay Point–San Francisco International Airport line serves the station seven days a week. Weekday service is provided between 4:00 a.m. and midnight, with Saturday service between 6:00 a.m. and midnight and Sunday service between 8:00 a.m. and midnight. Weekday service ranges from 5- to 10-minute headways in the peak direction (5- to 15-minutes in the non-peak direction) during the AM and PM peak commute periods, to 15- to 20-minute headways during off-peak midday and late evening periods. On weekends, 20-minute headways are provided all day.

According to the 2008 BART Station Profile Study, parking at the Lafayette BART Station consists of 1,526 spaces, including 380 monthly permit spaces and the remaining 1,146 requiring a daily fee. There is also a small parking lot on the south side of the station accessed from Happy Valley Road. In addition, 122 bicycle spaces are provided at the station. Bicyclists typically

TABLE 4.13-18 **GENERAL PLAN POLICIES RELEVANT TO TRANSIT, PEDESTRIAN, AND BICYCLE FACILITIES**

Goal/Policy Number	Goal/Policy Content
Goal C-6	*Provide an attractive, well-designed system of walkways for safe and efficient pedestrian movement in Lafayette. The walkway system should connect residential areas with the local and regional trails system, public transportation, schools, parks and other community amenities, and the Downtown Core area.*
Policy C-6.1	Master Walkways Plan: Continue to update and implement the Master Walkways Plan.
Policy C-6.2	Walkway Safety: Seek to maintain the City's walkways to avoid hazards.
Program C-6.2.1	Evaluate the safety of existing walkways along important pedestrian routes; upgrade and maintain them as necessary.
Goal C-7	*Reduce automobile travel demand.*
Policy C-7.1	Automobile Travel Demand: Seek to reduce vehicle trips by promoting alternatives to the single-occupant automobile.
Goal C-8	*Promote alternatives to the single-occupant automobile.*
Policy C-8.1	Increase Use and Availability of Public Transit: Take measures to increase use of public transit. Work with public transit providers to improve equipment, schedules, and better serve the community. Encourage providers to promote their services.
Policy C-8.2	Bicycles: Encourage bicycling by making it easier and safer for people to travel by bicycle.

Source: Lafayette General Plan, 2002, http://www.ci.lafayette.ca.us, accessed on October 27, 2009.

access the station's north side. Pedestrians without disabilities generally have access to the station, while those with disabilities currently are able to access the station only from the north side, on the other side of the State Route 24 freeway from downtown.

ii. Bus Transit

Bus service is provided locally by the CCTA County Connection. Three bus lines serve the Downtown Lafayette Specific Plan Area and the Lafayette BART Station as follows:

- Route 6 begins at the Lafayette BART Station and after a short segment on Mount Diablo Boulevard, heads south on Moraga Road to Saint Mary's College and Moraga Center. The route then proceeds northwesterly along Moraga Way until it terminates at the Orinda BART Station. This route generally follows the former Route 106 serving these same locations. Weekday service on Route 6 is provided at 40-minute headways during weekday commute periods beginning at 5:40 a.m. at the Lafayette BART Station. During midday non-commute periods, headways are at 2 hours. During weekends, service is provided between approximately 9:25 a.m. and 5:35 p.m. at 72- to 120-minute headways.

- Route 25 is a relatively new service designed to provide a continuous system ride, especially for employees, between areas to the northeast of Lafayette and the downtown. County Connection riders can now stay on that same transit system, rather than transferring to BART and paying an additional fare, to access Downtown Lafayette. Route 25 provides east-west service along Mount Diablo Boulevard, connecting the Lafayette and Walnut Creek BART Stations. Route 25 makes several local stops along Mount Diablo Boulevard between the Lafayette BART Station and Pleasant Hill Road, and then uses the State Route 24 freeway before terminating at the Walnut Creek BART Station. This weekday-only route operates at hourly headways in both directions between 7:30 a.m. and 6:30 p.m.

- Route 250, also known as the Gael Rail Shuttle, provides Thursday through Sunday service between St. Mary's College and the Lafayette BART station. From St. Mary's College, the route proceeds southwesterly on St. Mary's Road toward Moraga Center, then north on Moraga Road via the Rheem Center to Mount Diablo Boulevard, and connecting northwesterly until it terminates at the Lafayette BART station. On Thursday and Friday nights, service is provided between approximately 9:30 p.m. and 1:05 a.m. at 60- to 90-minute headways. On Saturday evenings, service is provided between approximately 6:30 p.m. and 1:05 a.m., mostly at hourly headways. On Sundays, service is provided between approximately noon and 1:05 a.m., mostly at hourly headways.

- In addition to the above three fixed bus routes, County Connection provides supplemental service for schools in the area, including Route 606 and Route 626 along Mount Diablo Boulevard and Moraga Road, and Route 625 along Mount Diablo Boulevard, through the Specific Plan area during school days. These buses operate with additional capacity.

iii. Other Local Transit Services

a) Lamorinda School Bus Program.

The City of Lafayette participates in a collaborative program with the City of Orinda and Town of Moraga to provide school bus service in the Lamorinda area. The goal of the program is to mitigate traffic congestion in Lamorinda on roadways south of State Route 24 by reducing the number of drivers on these streets. The CCTA funds a significant portion of the program, with supplemental funding from fees paid by (parents of) riders and grant funding. The program formerly served Lafayette Elementary School but still serves Stanley Middle School located immediately south of the Plan area. The Lamorinda School Bus service to Lafayette Elementary School was discontinued due to lack of ridership.

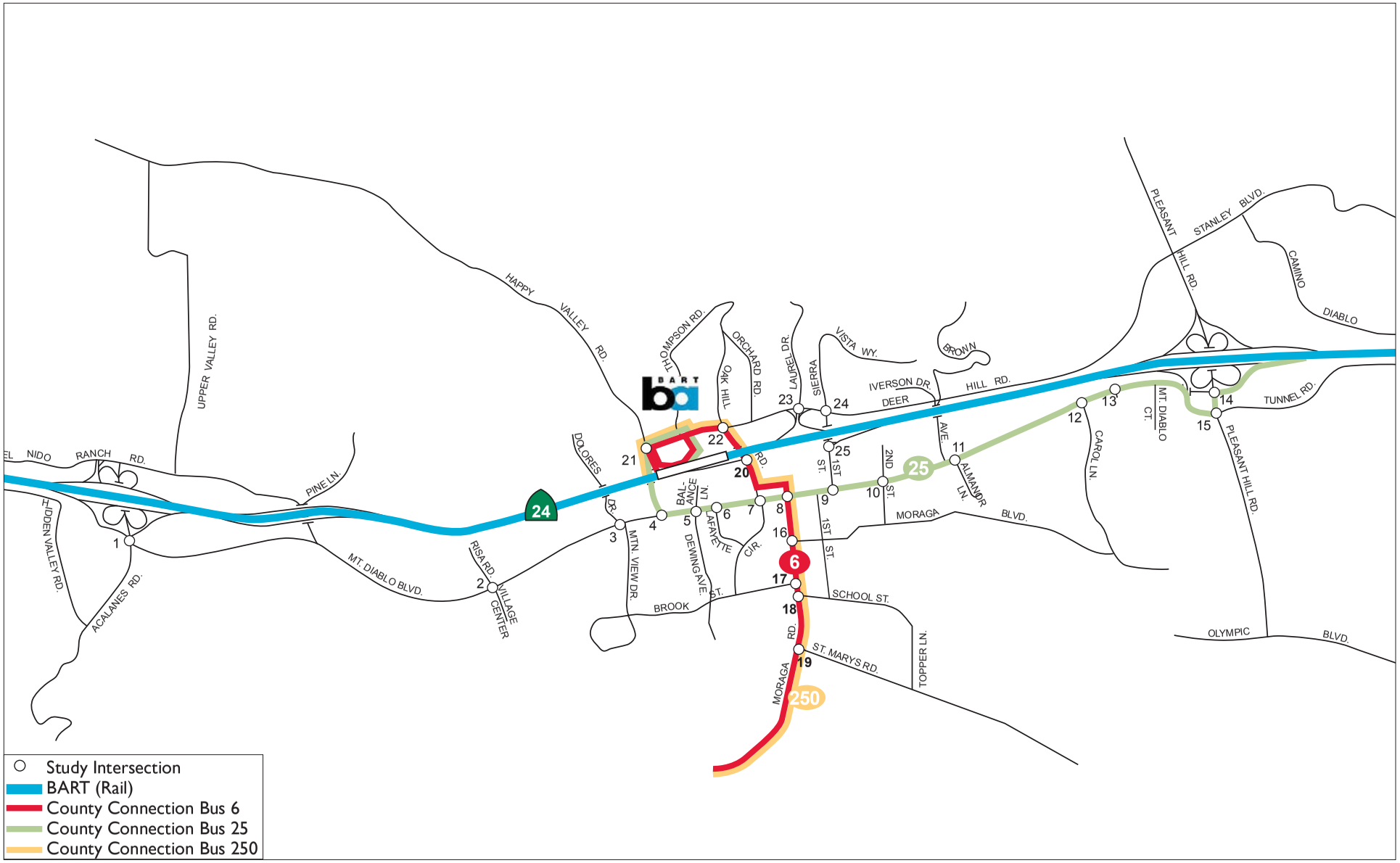
b) City of Lafayette Spirit Van.

The City operates the Spirit Van program for its senior residents, with door-to-door service provided by volunteer drivers.

Figure 4.13-6 illustrates existing transit routes in and around the Specific Plan Area.

b. Pedestrian Facilities

Pedestrian facilities in the Plan Area consist primarily of sidewalks distributed along roadways throughout the study area. One of the issues identified in the Plan are actual or effective "gaps" in the sidewalk system, due to a number of factors such as missing or heavily damaged sections, obstructions, or inadequate width. In the Downtown Retail District of the Plan, sidewalks are nearly continuous and often as generously wide as 8 to 12 feet. At the other end of the spectrum, outer areas such as the West End District have sidewalk



Source: TJKM

FIGURE 4.13-6

EXISTING TRANSIT ROUTES

widths as narrow as 2 feet and also include some locations with sidewalk gaps and discontinuities. Such gaps and discontinuities provide challenges to pedestrians with disabilities, whether due to vision, ability to walk, or confinement to a wheelchair. One of the circulation measures identified in the Specific Plan is to address gaps in the existing sidewalk network as part of capital streetscape improvement projects.

TJKM pedestrian counts reveal that pedestrian activity is most concentrated in the Downtown Retail district, along the Mount Diablo intersections with Lafayette Circle, Moraga Road, and First Street. These locations are characterized by numerous crosswalks, generous sidewalks, other pedestrian amenities, and a variety of land uses that are accessible by walking. On the other hand, pedestrian activity is less concentrated on the western and eastern edges of the study area, where the pedestrian environment is characterized by narrower, less continuous sidewalks, fewer crosswalks, and land uses that are primarily auto-oriented. It is this pedestrian environment relative to the downtown area that, together with the auto-oriented land uses, most likely is contributing to the low existing pedestrian volumes on the western and eastern ends of the study area. On the west end, most of the walking occurs when pedestrians are going to and from their offices or during the lunch period. In all cases, the amount of walking is weather dependent.

A number of multi-purpose pathways are also available to pedestrians in the Plan Area. These facilities include the Lafayette-Moraga Trail, which is located south and east of the Downtown Civic and Cultural District of the Specific Plan. It connects to St. Mary's College and central Moraga to the south, as well as the Pleasant Hill Road/Olympic Boulevard intersection to the east. Other facilities include a path adjacent to First Street, connecting between the new Lafayette Library and Lafayette Elementary School; a path extending north from Leigh Creekside Park at Moraga Boulevard, crossing Mount Diablo Boulevard and continuing east of Third Street; a path connecting the Mount Diablo Boulevard/Lafayette Circle intersection with the Lafayette BART Station; and both sides of Pleasant Hill Road south of Mount Diablo Boulevard.

c. Bicycle Facilities

The study area consists of a full range of bicycle facilities that connect the study area with various destinations within and outside Lafayette. According to the Lafayette Bicycle Master Plan, the Plan Area includes off-street bicycle/multi-use paths (Class I facilities), on-street striped and signed bicycle lanes (Class II facilities), signed routes on roadways without striped lanes (Class III facilities), and sharrow pavement legends. Sharrow pavement legends are lane markings that designate a roadway as a shared space for bicycles and vehicles.

The Class I facilities include the Lafayette-Moraga Trail, which is located south and east of the Downtown Civic and Cultural District of the Specific Plan. It connects to St. Mary's College and central Moraga to the south, as well as the Pleasant Hill Road/Olympic Boulevard intersection to the east. Other Class I facilities include a path adjacent to First Street, connecting between the new Lafayette Library and Lafayette Elementary School; a path extending north from Leigh Creekside Park at Moraga Boulevard, crossing Mount Diablo Boulevard and continuing east of Third Street; a path connecting the Mount Diablo Boulevard/Lafayette Circle intersection with the Lafayette BART Station; and both sides of Pleasant Hill Road south of Mount Diablo Boulevard.

Most of Mount Diablo Boulevard through the Plan Area includes Class II bicycle lanes. The exception is between Dolores Drive/Mountain View Drive and First Street in the Downtown Retail District, where a landscaped median is provided, and sharrow pavement legends instead of striped bicycle lanes. In addition, Pleasant Hill Road on the eastern edge of the study area and Deer Hill Road on the north edge both include on-street bicycle lanes.

Currently, the only designated Class III route in which bicycles share the road with motorists is Brown Avenue between Deer Hill Road and Mount Diablo Boulevard.

Although there is already an extensive network of Class I, II, and III bicycle facilities, there are still limiting factors to bicycling in the downtown and opportunities to expand and improve the system. The lack of bicycle lanes (currently only sharrow markings) on Mount Diablo Boulevard between Dolores Drive / Mountain View Drive and First Street, together with traffic congestion and speeds, limit accessibility for bicyclists in the downtown. The Lafayette Bicycle Master Plan includes a number of bicycle facility improvements aimed at supplementing the current Lafayette bicycle system, including within the Plan Area.

Bicycle parking facilities, such as lockers or cages for long-term (over 2 hour) parking and racks for shorter-term parking, can encourage bicycle use for transportation. The Lafayette BART station and the new Lafayette Library and Learning Center provide excellent bike parking facilities. Although some retail buildings and a few office complexes provide bike racks, generally the Plan Area provides only limited bike parking facilities that can be difficult to find. Bicycle support facilities include those that cyclists may need during their trip, such as drinking fountains, restrooms, and repair shops, and end-of-trip facilities, such as showers and changing rooms. In the Plan Area, drinking fountains are available at Plaza Park and the new Library, public restrooms are available in public buildings, and two bicycle shops provide repair service. The City currently has no ordinance requiring bicycle parking or support facilities, although the Lafayette Mercantile development was required to provide bicycle parking. The Lafayette Bikeways Master Plan recommends adopting bicycle parking requirements and encouraging provision of end-of-trip support facilities in new development downtown.

3. Standards of Significance

The Plan would have a significant impact on transit, pedestrian, and bicycle conditions in the Plan Area if it would:

1. Generate added transit ridership that would increase the peak hour average ridership at a BART station by three (3) percent where average waiting time at fare gates would exceed one minute.

2. Generate added transit ridership that would increase the AM load factor on a County Connection bus line such that it would be over capacity during the AM peak hour (load factor greater than 1.0).
3. Create demand for public transit services above that which is provided or planned; disrupt or interfere with existing or planned transit services or facilities; or create inconsistencies with adopted transit system plans, guidelines, policies, or standards.
4. Disrupt existing bicycle or pedestrian facilities; interfere with planned bicycle or pedestrian facilities; or create inconsistencies with adopted bicycle or pedestrian system plans, guidelines, policies, or standards.

4. Impact Discussion

a. Public Transportation Impacts

The Plan would increase residential, retail commercial, and office activity in downtown Lafayette. The increased activity would have the potential to increase rider patronage, particularly during commute peak hours, on the two local County Connection bus lines serving the downtown, as well as the BART regional rail service.

Based on the transit trip reduction percentages applied to the proposed project trip generation, it is estimated that the project would add 518 daily trips using various forms of public transportation based on the proximity of proposed Plan land uses to fixed-route BART and County Connection services. Similarly, 76 AM peak hour trips are expected to be on transit, 35 transit trips are estimated during the midday peak hour (2:15 to 3:15 p.m.), and 84 trips are expected to use transit during the PM peak hour.

The 2008 BART Station Profile Study, online BART ridership figures, and the 2008 County Connection Short Range Transit Plan (SRTP) were reviewed for the available ridership data to determine the potential impacts of the proposed project on these respective transit systems. Based on the BART data sources, average weekday passenger entries and exits at the Lafayette BART Station totaled approximately 6,730 riders in Spring 2008. Similarly, the County Connection SRTP estimated 870 average weekday riders on the

former Route 106 (similar to current Route 6), and 100 average weekday riders on the previously operated Route 206. This amounts to 970 average weekday riders on fixed-route County Connection services within the Specific Plan study area.

Comparing the average weekday transit ridership of BART and County Connection, BART amounts to 87 percent of this ridership in the Specific Plan study area (6,730 / 970 + 6,730), with County Connection riders comprising the remaining 13 percent. These transit provider rider percentages were applied to the project-generated transit trips described above, and the resulting potential impacts to BART and County Connection bus service are discussed further below.

i. BART

Based on the expected transit trip generation from the Plan and the estimated 87 percent share of transit trips using BART, it is estimated that the Plan would generate 452 new daily trips at the Lafayette BART Station, including 66 during the AM peak hour, 31 during the midday peak hour, and 73 during the PM peak hour. Of the new daily trips, 380 trips would be by residents (190 people leaving Lafayette and later returning) and 72 trips would be by employees (36 people arriving and later leaving). The peak hour trips would consist of 56 residents leaving and 10 employees arriving during the AM peak hour, 28 residents and three employees during the mid-day peak hour, and 64 residents and nine employees during the PM peak hour.

Depending on the peak hour, these newly generated BART trips would add between 11 and 12 percent to existing average weekday peak period ridership entering and exiting at the Lafayette station. Table 4.13-19 shows the results of the project-added BART trip share analysis. Because buildout of the Plan is expected to increase the peak hour average ridership at the Lafayette BART Station by more than 3 percent during peak hours, this would result in a *significant* impact.

TABLE 4.13-19 **ESTIMATED PROJECT-ADDED TRIPS AT THE LAFAYETTE BART STATION**

	Existing Average Weekday BART Trips	Project-Added BART Trips	% Increase
Daily	6,730	452	7%
AM Peak	560	66	12%
Mid-Day Peak	260	31	12%
PM Peak	650	73	11%

Note: Overall average weekday trips at the Lafayette BART Station include average weekday entries plus exits at the station.
Source: BART Short-Range Transit Plan (2008), BART Station Profile Study (2008), BART ridership data (2009), TJKM (2009).

The 2008 BART Station Profile Study estimates that all parking spaces at the Lafayette Station typically fill up by 7:00 a.m. on weekdays. Walking or bicycling between the BART station and the Specific Plan areas will be relatively convenient, especially in comparison to the walking distance between the station entrance and the most likely available parking spaces given the high parking occupancy. Therefore, the BART parking demand from additional transit riders generated by the Plan would be negligible, and the impact to BART parking at the station would be *less than significant*.

ii. County Connection Bus Transit

a) Route 6

For the purposes of this analysis, the potential impacts to Route 6 are analyzed based on the former Route 106 that is similar in terms of current routing. According to the 2008 County Connection SRTP, the former Route 106 had an average weekday ridership of 870 passengers in 2007. The project is expected to add nine, four, and ten trips to this route for the AM, midday, and PM peak hours, respectively. The County Connection SRTP found that the 2007 AM peak hour load factor for this route was 0.65, which means this

route was less than full (1.0) during this critical time period. At most, the Plan is expected to add 10 trips to the route during peak hours.

Given that this route operates multiple runs during each peak hour and assuming an even distribution of new riders on each run, it is reasonable to expect that the added project trips would not be significant so as to increase the load factor above 1.0 (full). Therefore, *no impact* is expected from the Plan on this route.

b) Route 25

According to 2009 data provided by County Connection staff, Route 25 had an average weekday ridership of approximately 60 passengers in Spring 2009. The Plan is expected to add one trip at most to this route during both the AM and PM peak hours. County Connection staff indicates that this route currently operates well below capacity during peak periods. The addition of one trip during any peak hour would not be significant so as to increase the load factor above 1.0 (full). Therefore, *no impact* is expected from the Plan on this route.

c) Route 250

According to 2009 data provided by County Connection staff, Route 250 has an average weekday ridership of five passengers or less on its Thursday and Friday night service. The Route 250 average ridership is higher for its weekend service, at approximately 38 passengers on Saturday evenings and 21 passengers on Sundays in Fall 2009. Because Route 250, known as the Gael Rail Shuttle, primarily serves to connect St. Mary's College with the Lafayette BART station, the project is expected to add one trip at most to this route during its peak hours. County Connection staff indicates that this route currently operates well below capacity during peak periods. The addition of one trip during any peak hour would not be significant so as to increase the load factor above 1.0 (full). Therefore, *no impact* is expected from the Plan on this route.

d) Routes 606, 625 and 626

The proposed project has the potential to add riders, particularly during the AM peak and afternoon school peak hours, to the County Connection bus routes for local students in the Plan Area, Routes 606, 625 and 626. Since precise student numbers are not yet known for the Plan, it is speculative to quantify the potential impacts to these school routes resulting from additional riders.

Table 4.13-20 shows the number of project trips expected to use the two primary County Connection bus Routes 6 and 25 in the Plan Area.

iii. Other Local Transit Services

a) Lamorinda School Bus Program

With the addition of residential units within the Downtown Specific Plan area, the proposed project has the potential to add to the rider demand for the Lamorinda School Bus Program. The program includes service to Stanley Middle School and Springhill and Burton Valley Elementary Schools. Participation in the program requires Lamorinda parents to submit an application for their children to be added to the school bus service and to prepay for that service for the school year. Additionally, Stanley Middle School and Lafayette Elementary School are located within convenient walking or bicycling distance of a significant portion of the Specific Plan areas. As a result, the additional schoolchildren from the Plan are expected to have minimal effects to the program because they will walk or bike to school or their parents would pay for the service if they choose to use it. Therefore, impacts would be *less than significant*.

b) City of Lafayette Spirit Van

With the addition of residential units within the Plan Area, the Plan has the potential to add senior residents to the rider demand for the Spirit Van program. Because precise senior resident numbers are not yet known for the Plan, it is speculative to quantify the potential impacts to the Spirit Van service that would result from additional riders.

TABLE 4.13-20 **ESTIMATED PROJECT ADDED COUNTY CONNECTION BUS TRIPS**

	Project Added Bus Trips (Two Routes)	Route 6	Route 25
Daily	65	58	7
AM Peak Hour	10	9	1
Mid-Day Peak Hour	4	4	0
PM Peak Hour	11	10	1

Source: County Connection Short-Range Transit Plan (2008), TJKM (2009).

b. Pedestrian Facilities Impacts

Development under the Plan would have the potential to generate pedestrian demand from all components – residential, retail, and office components. The Plan would also have the potential to draw pedestrians from nearby residential and adjoining neighborhoods, as well as visitors.

Among the primary goals of the Plan are to balance vehicular travel through the downtown by providing a safe pedestrian and bicycle system, as well as to ensure an accessible and continuous pedestrian network with appropriate supporting infrastructure. For each Downtown District in the Plan Area, the Plan calls for measures that include closing gaps in the current downtown walkway system and installing crosswalks at strategic locations for pedestrians. These and other planned measures are consistent with the 2008 City of Lafayette Walkways Plan, which is incorporated into the Plan.

It should be noted that the additional crosswalks proposed within the Plan Area would require features that enhance the safety and overall walking experience for pedestrians. Such features include additional street lighting, high visibility pavement markings and traffic signs, bulbouts, and raised medians.

Another feature may be a pedestrian-activated warning light system, typically characterized by in-pavement flashing lights to warn motorists of pedestrians about to cross a roadway.

The proposed pedestrian improvements under the Plan are expected to enhance the current pedestrian experience in downtown Lafayette. The Plan also proposes streetscape improvements that include median landscaping, including on Mount Diablo Boulevard. These measures are not expected to impact existing or proposed pedestrian facilities under the Plan. Therefore, potential impacts from the improvements proposed and the additional pedestrians generated by the Plan are expected to be *less than significant*.

c. Bicycle Facilities Impacts

By incorporation, the Plan includes all projects in the City of Lafayette Bikeways Master Plan (2006). The following projects are planned within the Plan Area (with completions noted):

- Sharrows: Mount Diablo Boulevard between Mountain View Drive and First Street (completed).Class I: Facility parallel to and on south side of State Route 24 freeway between El Nido Ranch Road and Brown Avenue
- Class III:
  - Happy Valley Road north of Mount Diablo Boulevard
  - Mountain View Drive between Bickerstaff Road and Brook Street
  - Dewing Avenue between Mount Diablo Boulevard and Bickerstaff Road
  - Moraga Road south of Mount Diablo Boulevard
  - Moraga Boulevard between Moraga Road and Lafayette-Moraga Trail
- Bicycle Boulevards: The City of Lafayette Bikeways Master Plan defines a Bicycle Boulevard, also known as bicycle priority road, as a roadway that allows all types of vehicles, similar to Class III signed routes, but which has additional features to enhance bicycle safety and security. Such features include traffic circles, bulbouts, bicycle destination signage, pavement stencils designating Bicycle Boulevard status, and various intersection treatments including traffic signal bicycle detection, four-way stops,

and high-visibility crosswalks. The proposed Bicycle Boulevards in the Lafayette Bikeways Master Plan include:

- Mountain View Drive between Mount Diablo Boulevard and Bickerstaff Road
- Bickerstaff Road between Mountain View Drive and Dewing Avenue
- Dewing Avenue between Bickerstaff Road and Brook Street
- Brook Street between Dewing Avenue and Moraga Road
- Hough Avenue between Brook Street and Lafayette Circle
- Entire length of Lafayette Circle
- Entire length of Golden Gate Way
- School Street between Moraga Road and Lafayette-Moraga Trail

The Plan is expected to generate some demand for bicycle travel. The City Bikeways Plan, by incorporation with the Plan, would enhance existing bicycle facilities in the Plan Area. The various streetscape improvements proposed by the Plan are expected to keep existing bicycle facilities intact and are not expected to affect future planned bicycle facilities. Therefore, potential impacts from the proposed improvements and the additional bicycle trips generated by the Plan are expected to be *less than significant*.

5. Impacts and Mitigation Measures

Impact TRAF-11: Buildout of the Plan would be expected to add more than 3 percent to the peak hour average ridership at the Lafayette BART Station during peak hours. Because the peak hour average ridership would increase by more than 3 percent with buildout of the Plan, BART may need to add fare gates at the Lafayette BART Station if the average waiting times at existing fare gates would exceed one minute. This would be a *significant* impact.

Mitigation Measure TRAF-11: Monitor waiting times at the fare gates at the Lafayette BART station, and at such time that average waiting times exceed one minute, install additional fare gates. The City of Lafayette and developers of individual projects within the Plan Area will collectively need to collaborate with BART on strategies and funding to ad-

dress this potential impact, because no single development project by itself is likely to trigger the need for additional BART fare gates.

Significance After Mitigation: The addition of fare gates is expected to mitigate this impact to a *less-than-significant* level.

C. Parking

This section describes existing conditions with regard to parking within the study area, and examines the potential effects that the proposed project would have on study area parking facilities.

1. Regulatory Framework

Goals and policies concerning the provision of parking in the downtown are included in recent City of Lafayette documents and community efforts, including the Circulation Element of the City General Plan, the Circulation Element of the Downtown Specific Plan, and a parking management strategy developed for the Lafayette Downtown Strategy. Relevant goals and policies from the City General Plan are listed in Table 4.13-21.

2. Existing Conditions

In 2007, Fehr & Peers Transportation Consultants conducted existing parking supply and occupancy surveys in downtown Lafayette to determine utilization of downtown parking during various times of day. Written surveys that gathered perceptions of downtown parking users were also collected. An approximate total of 6,360 off-street spaces and 650 on-street spaces were observed in the study area. In the core downtown subarea along Mount Diablo Boulevard between Second Street and Happy Valley Road, 13 large parking areas each with a minimum 50 spaces were observed, representing an estimated total of 2,175 parking spaces.

During the 2007 study, an occupancy survey was performed during a City-identified peak Friday between 3:00 and 5:00 p.m. While some specific lots such as the Trader Joe's/Diablo Foods lot and the Safeway Lot were observed

TABLE 4.13-21 **GENERAL PLAN POLICIES RELEVANT TO PARKING**

Goal/Policy Number	Goal/Policy Content
Goal C-4	*Coordinate land use and circulation planning.*
Policy C-4.2	Traffic Mitigation: Require new developments to pay their fair share of circulation improvements.
Program C-4.2.2	Ensure that new developments provide adequate on-site improvements, such as delivery access, on-site vehicle, bicycle and pedestrian circulation amenities, public transit facilities, and off-street parking, as appropriate.

Source: Lafayette General Plan, 2002, http://www.ci.lafayette.ca.us, accessed on October 27, 2009.

at 100 percent (full) occupancy, many other spaces were found to be unoccupied in the subarea between Second Street and Happy Valley Road. Those unoccupied spaces were in on-street locations, as well as various small off-street lots and underground/under-building facilities. Generally, the lower-occupancy facilities were found to be one-half to two-thirds occupied, though many of the off-street locations were restricted to employees and patrons of specific businesses.

3. Standards of Significance

The Plan would have a significant impact on parking conditions in the Plan Area if it would:

1. Create demand for parking above the supply which exists or can feasibly be provided.
2. Disrupt or interfere with existing or planned parking facilities.
3. Create inconsistencies with adopted parking plans, guidelines, policies, or standards.

4. Impact Discussion

During the Lafayette Downtown Strategy community effort in 2008, opportunity sites for downtown off-street public parking were identified that could

result in either a surface lot or a structure. Selection criteria included each site's effect on local traffic congestion, accessibility for visitors from various areas of the City, balance with other large parking lots located in downtown, and overall central location within downtown. Five potential locations were determined from these screening criteria and resulted in the following rank order:

1. Lot on Northwest Corner of Mount Diablo Boulevard/Oak Hill Road
2. Safeway Lot (Northeast Corner of Mount Diablo Boulevard/Oak Hill Road)
3. Lot on west side of Lafayette Circle East
4. McCaulou's/Albertsons (Future Whole Foods) Lot - Northwest Corner of Mount Diablo Boulevard/First Street
5. West side of First Street between Mount Diablo Boulevard and Golden Gate Way

TJKM evaluated each potential parking site for potential traffic impacts to nearby study intersections. Such potential impacts would result primarily from added trips generated by new or modified existing land uses under the Downtown Specific Plan that are located near a new parking structure, as well as trips diverted to the new parking structure from other nearby existing parking locations consolidated by the new structure. In addition, localized operational impacts would be expected to occur, such as vehicle queuing at parking lot driveway entrances and additional U-turns at intersections up-stream and downstream of driveways that may be restricted to right-turn-only access. Parking activity at each potential parking structure site has the potential for impacting the following intersections, as listed below:

1. Lot on northwest Corner of Mount Diablo Boulevard/Oak Hill Road:
   - Mount Diablo Boulevard/Lafayette Circle (west)
   - Mount Diablo Boulevard/Oak Hill Road / Lafayette Circle (east)
2. Safeway Lot (Northeast Corner of Mount Diablo Boulevard / Oak Hill Road):
   - Mount Diablo Boulevard/Oak Hill Road/Lafayette Circle

- Mount Diablo Boulevard/Moraga Road

3. Lot on west side of Lafayette Circle East:
   - Mount Diablo Boulevard/Lafayette Circle (west)
   - Mount Diablo Boulevard/Oak Hill Road/Lafayette Circle (east)
4. McCaulou's/Albertsons Lot (Northwest Corner of Mount Diablo Boulevard/First Street):
   - Mount Diablo Boulevard / Moraga Road
   - Mount Diablo Boulevard / First Street
5. West side of First Street between Mount Diablo Boulevard and Golden Gate Way:
   - Mount Diablo Boulevard / Moraga Road
   - Mount Diablo Boulevard / First Street

The Plan proposed several policies relevant to parking. Proposed parking policies that are most relevant to this evaluation are listed in Table 4.13-22. Specific Plan Policy C-5.3 would retain the City's current parking standards until additional off-street parking, such as the potential parking facilities described above, is provided. Other policies and programs in the Plan would encourage aggregating parking lots and providing cross-easements to increase parking and facilitate informal connections between parking lots and buildings, which would allow more flexible use and increase the availability of parking spaces. The Plan also includes programs intended to reduce parking demand and discourage spillover parking into neighborhoods through outreach to downtown businesses regarding off-site parking options, alternative commute modes and commuter incentive programs for employees, Transportation Demand Management measures, and continuing Lafayette's Residential Parking Permit Program.

Under the City's current parking standards, new development would provide at least enough parking supply to accommodate the peak demands it would generate. With this policy, along with those to develop additional parking supply and encourage reduced demand, the Plan would not be expected to create demand for parking above the supply which can feasibly be provided.

TABLE 4.13-22 **DOWNTOWN SPECIFIC PLAN POLICIES RELEVANT TO PARKING**

Goal/Policy Number	Goal/Policy Content
Circulation Goal 5	*Support adequate parking in the downtown.*
Policy C-5.1	Adopt a comprehensive, market-driven parking strategy that addresses the needs of both downtown customers and employees and on-street and off-street parking.
Policy C-5.2	Encourage a "park once" philosophy among customers to reduce vehicle trips where clusters of complementary uses and small areas of the downtown make it practical and convenient.
Policy C-5.3	Retain the City's current parking standards until additional off-street parking is provided.
Policy C-5.4	Demand charging Stations in all new development.
Policy C-5.5	Discourage undesirable spillover parking into neighborhoods within and adjacent to the downtown through the Transportation Demand Management measures in Section 7.6 [of the Downtown Specific Plan].

Source: City of Lafayette, 2009, Revised Draft Downtown Lafayette Specific Plan.

The policies and programs proposed by the Plan would encourage more effective use of existing parking and facilitate development of planned parking facilities, potentially improving parking conditions in the Plan Area. Therefore, the Plan would not be expected to disrupt or interfere with existing or planned parking facilities. In addition, implementation of the Plan would not create inconsistencies with adopted parking plans, guidelines, policies, or standards. Therefore, impacts to parking conditions in the Plan Area would be *less than significant*.

5. Impacts and Mitigation Measures

Depending on the ultimate location of the proposed downtown public parking structure under the Plan, the following localized traffic operational impacts may result at the study intersections located near the respective parking facility locations identified above.

Impact TRAF-12: Increased localized traffic would occur on short segments of roadways, particularly those with medians, on which a parking facility driveway would be located. Specifically, most of the potential parking facility sites are likely to include a right-turn-only access directly to/from Mount Diablo Boulevard, which has a landscaped median that allows left turns at signalized intersections only. As a result, additional vehicles would be expected to use existing left turn pockets on Mount Diablo Boulevard for U-turns as part of their entering or exiting movement at a parking facility. This potential for additional U-turns assumes that a future parking facility accessing Mount Diablo Boulevard would be limited to right-in/right-out access. It is either infeasible or undesirable to provide additional median openings along Mount Diablo Boulevard for direct left-turn access at parking facility driveways, particularly where there is existing or planned median landscaping, or the proposed driveway is located too close to the functional area of an adjacent intersection to provide adequate traffic safety and operations. This would be a *significant* impact.

Mitigation Measure TRAF-12: Address localized roadway circulation impacts during the environmental and design review processes for the downtown parking facility location that is ultimately chosen. Measures to consider for minimizing impacts include providing adequate signage that efficiently leads motorists to the parking structure and providing additional median openings.

Significance After Mitigation: Signage is not likely to reduce the increased vehicle activity on short roadway segments, and providing additional median openings may be infeasible or undesirable given landscaping improvements or the close proximity of an adjacent intersection. As a result, this impact is *significant and unavoidable*.

Impact TRAF-13: Vehicle queuing activity is expected to occur at the potential parking facility entrances. Causes for such queuing include delays from vehicles maneuvering to enter or exit parking stalls and possible access con-

trol gates for permit or paid parking systems. At some locations, such as Location #1 at the northwest corner of the Mount Diablo Boulevard/Oak Hill Road intersection, vehicle queuing could potentially extend upstream on westbound Mount Diablo Boulevard across the Oak Hill Road intersection. This queuing would result in additional vehicle delay at the overall intersection, as well as at the westbound Mount Diablo Boulevard and southbound Oak Hill Road approaches. This would be a *significant* impact.

Mitigation Measure TRAF-13: Amend the Plan's Circulation section regarding parking to include a Program to address vehicle queuing impacts during the environmental and design review processes for the downtown parking facility location that is ultimately chosen. In this added Program, measures to consider for minimizing impacts should include providing adequate driveway throat depth to minimize potential queue spillover onto the adjacent roadway, and multiple entry lanes on-site to store vehicles that are waiting to enter the structure.

Significance After Mitigation: The driveway throat depth and on-site vehicle storage measures can mitigate potential queuing impacts on the adjacent roadway resulting from the future parking facility. As a result, this impact is expected to be mitigated to a *less-than-significant* level.

Impact TRAF-14: Bicycle and pedestrian circulation and safety would be affected at any of the potential parking facility locations. Additional access driveways and increased vehicle activity at new parking facilities would increase the potential exposure of bicyclists and pedestrians to turning vehicles on all roadways that will serve the chosen future parking facility's driveways. This additional exposure increases the risk of collisions and further disrupts the walking and bicycling experience along the roadway. Impacts on bicycle circulation would also occur if parking facilities lack safe and secure parking for bikes. This would be a *significant* impact.

Mitigation Measure TRAF-14: Amend the Plan's Circulation section regarding parking to include Programs to address bicycle and pedestrian

circulation and safety impacts during the environmental and design review processes for the downtown parking facility location that is ultimately chosen. In these added Programs, measures to consider for minimizing impacts should include limiting the number of vehicle access points on any one roadway serving the future parking facility; providing design elements such as visible and audible devices that warn pedestrians and bicyclists of vehicles entering and exiting parking facility driveways; providing signs and pavement markings that emphasize clear paths for pedestrians, bicyclists, and motorists at potential driveway conflict points; and providing safe and secure parking for bikes.

Significance After Mitigation: Collectively, these measures have the potential to reduce impacts to pedestrians and bicyclists due to future parking facilities to a *less-than-significant* level.