

*Final Report*

# **Corte Madera General Plan EIR Transportation Analysis**



**FEHR & PEERS**  
TRANSPORTATION CONSULTANTS

**332 Pine Street, 4th Floor  
San Francisco, CA**

**SF07-0338**

**August 8, 2008**

**CORTE MADERA GENERAL PLAN EIR**

**TRANSPORTATION ANALYSIS REPORT**

**AUGUST 8, 2008**

## TABLE OF CONTENTS

<b>1. Introduction</b> .....	<b>1</b>
Study Purpose.....	1
Study Methods .....	1
Study Area and Forecast Scenarios.....	5
Report Organization .....	6
<b>2. Existing Conditions</b> .....	<b>8</b>
Environmental Setting .....	8
Existing Conditions.....	8
Regulatory Setting.....	14
<b>3. Proposed General Plan Conditions</b> .....	<b>15</b>
Project Description .....	15
Planned Roadway Improvements .....	15
Cumulative Traffic Volumes .....	17
Proposed general Plan Operating Conditions .....	18
<b>4. Impact Analysis</b> .....	<b>22</b>
Significance Criteria .....	22
Impact Summary .....	24
<b>5. Project Alternative Conditions</b> .....	<b>35</b>
Project Description .....	35

## APPENDICES

Appendix A: Additional Figures

Appendix B: Corte Madera Travel Demand Model Calibration and Validation Results

Appendix C: Summary of Future Conditions without the Proposed General Plan

Appendix D: Trip Generation Analysis Results

Appendix E: Analysis Worksheets

## LIST OF FIGURES

Figure 1:	Study Area and Intersection Locations.....	7
Figure 2:	Existing PM Peak Hour Traffic Volumes .....	9
Figure 3:	Existing Transit Routes and Bicycle Facilities .....	13
Figure 4:	PM Peak Hour Traffic Volumes with Proposed General Plan .....	19
Figure 5:	Lane Configurations with Mitigation Measure 1.1 .....	30
Figure 6:	Lane Configurations with Mitigation Measure 1.2 .....	31
Figure 7:	Lane Configurations with Mitigation Measure 1.3 .....	31

## LIST OF TABLES

Table 1:	Qualitative Description of Level of Service.....	2
Table 2:	Intersection LOS Criteria .....	3
Table 3:	Freeway Segment LOS Criteria.....	4
Table 4:	Existing Intersection Operating Conditions .....	10
Table 5:	Existing Freeway Segment Operating Conditions.....	11
Table 6:	Net Change in Vehicle Trips with Proposed General Plan.....	18
Table 7:	Intersection Levels of Service For Proposed General Plan .....	20
Table 8:	Cumulative plus Project Freeway Segment Operating Conditions .....	21
Table 9:	Net Change in Vehicle Trips for Proposed General Plan Alternatives .....	36
Table 10:	Intersection Levels of Service For Project Alternatives.....	37
Table 11:	Summary of Intersection and Freeway Traffic Impacts.....	39

# 1. INTRODUCTION

## STUDY PURPOSE

The Town of Corte Madera is in the process of updating its 1989 General Plan. The Draft 2025 General Plan, originally released in late 2004 and updated in September 2007, proposes several land use changes to promote the community's economic development, protect and enhance the Town's tax base, and encourage mixed-use development. This study evaluates the potential transportation impacts resulting from implementation of the proposed 2025 Corte Madera General Plan.

In addition to future development of vacant and underutilized parcels allowed under the Town's existing 1989 General Plan, land use changes associated with implementation of the proposed 2025 Corte Madera General Plan include an increase in the allowable floor-area ratio (FAR) of the Village at Corte Madera and the Corte Madera Town Center parcels to 0.60.<sup>1</sup> Compared to the existing General Plan, the proposed General Plan also includes an expansion in the allowable FAR of two parcels at the southwest corner of Paradise Drive and San Clemente Avenue.

Three alternatives to the proposed General Plan are also considered as part of this analysis. Alternative 1 consists of the expansion and development of the Village at Corte Madera as a mixed-use development in addition to other future development allowed under the Town's existing General Plan. Alternative 2 includes the redevelopment of the parcel at the northeast corner of Tamal Vista Boulevard and Wornum Drive in addition to future development allowed under the Town's existing General Plan. Alternative 3 is a combination of Alternative 1 and Alternative 2.

This document is intended as a supporting report to the General Plan Environmental Impact Report (EIR), and presents detailed technical analysis conducted to determine the transportation effects of the land use changes being considered as part of the proposed General Plan. While sections may be incorporated into the EIR, this document is not intended to be the entire basis for evaluating transportation impacts in the General Plan EIR.

## STUDY METHODS

This report describes potential impacts on the transportation system associated with adoption of the proposed Corte Madera General Plan. The impact analysis evaluates the local and regional roadway, transit, bicycle, and pedestrian components of the overall transportation system.

Level of Service (LOS) is a qualitative assessment of perceived traffic conditions by motorists. Level of service is a measure of a number of factors affecting traffic operating conditions including speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort, and convenience. It is measured quantitatively (in terms of vehicular delay) and described on a scale from LOS A to LOS F, with LOS A representing essentially free-flow conditions and LOS F indicating substantial congestion and delay. Table 1 presents a qualitative description of each service level.

Since automobile travel has been the dominant form of transportation, level of service has traditionally been measured for vehicles, with minimal regard to bicycle, pedestrian, and transit conditions. This bias unintentionally but inherently ignores overall mobility and conditions for non-auto road users and perpetuates a system that focuses on expanding auto capacity. A key goal of the proposed Corte Madera General Plan is to ensure the accommodation of multiple travel modes on the existing street network.

---

<sup>1</sup> The current floor-area ratio of the shopping centers ranges from 0.32 to 0.40.

**TABLE 1  
QUALITATIVE DESCRIPTION OF LEVEL OF SERVICE**

Level of Service	Driver's Perception
A/B	LOS A/B is characterized by light congestion. Motorists are generally able to maintain desired speeds on two and four lane roads and make lane changes on four lane roads. Motorists are still able to pass through traffic-controlled intersections in one green phase. Stop-controlled approach motorists begin to notice absence of available gaps.
C	LOS C represents moderate traffic congestion. Average vehicle speeds continue to be near the motorist's desired speed for two and four lane roads. Lane change maneuvers on four lane roads increase to maintain desired speed. Turning traffic and slow vehicles begin to have an adverse impact on traffic flows. Occasionally, motorists do not clear the intersection on the first green phase.
D	LOS D is characterized by congestion with average vehicle speeds decreasing below the motorist's desired level for two and four lane roads. Lane change maneuvers on four lane roads are difficult to make and adversely affect traffic flow like turning traffic and slow vehicles. Multiple cars must wait through more than one green phase at a traffic signal. Stop-controlled approach motorists experience queuing due to a reduction in available gaps.
E	LOS E is the lowest designation possible without stop-and-go operations. Driving speeds are substantially reduced and brief periods of stop-and-go conditions can occur on two and four lane roads and lane changes are minimal. At signalized intersections, long vehicle queues can form waiting to be served by the signal's green phase. Insufficient gaps on the major streets cause extensive queuing on the stop-controlled approaches.
F	LOS F represents stop-and-go conditions for two and four lane roads. Traffic flow is constrained and lane changes minimal. Drivers at signalized intersections may wait several green phases prior to being served. Motorists on stop-controlled approaches experience insufficient gaps of suitable size to cross safely through a major traffic stream.

Source: Fehr & Peers (interpreted from 2000 *Highway Capacity Manual*).

The 1989 Corte Madera General Plan established LOS C as the desired standard for travel during the AM and PM peak hours. Adoption of the proposed Corte Madera General Plan would establish a revised standard of LOS D. Even with the revised standard, there still may be instances when it is not possible to meet the desired LOS without negatively impacting other travel modes. Therefore, it may be necessary to consider adoption of a mechanism to allow certain locations to exceed the LOS standard if multi-modal improvements are installed as an alternative to roadway capacity expansion; development of such a mechanism is outside the scope of this document.<sup>2</sup>

### ***Intersection Operating Conditions***

#### Signalized Intersections

The operations of signalized intersections were calculated using the method described in the 2000 HCM. This method correlates LOS to the average control delay experienced at the intersection. Control delay includes initial deceleration, queue move-up time, time stopped, and final acceleration. The control delay is correlated to a service level as summarized in Table 2.

<sup>2</sup> If a mechanism allowing exceptions to LOS standards were adopted, it should include language prioritizing the movement of people within the community, including the preservation of quality of life and community character, over maintenance of a given traffic LOS.

### Unsignalized Intersections

For unsignalized (all-way stop-controlled and side-street stop-controlled) intersections, the 2000 HCM method for unsignalized intersections was used. With this method, operations are defined by the average control delay per vehicle (measured in seconds). The control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue.

At all-way stop-controlled intersections, an intersection average delay is calculated. At side-street stop-controlled intersections, the delay is calculated for each stop-controlled movement, for the left-turn movement from the major street and for the intersection as a whole. Both the average intersection delay and the highest movement/approach delay are reported for side-street stop-controlled intersections. Delay is correlated to a service level as summarized in Table 2.

<b>TABLE 2 INTERSECTION LOS CRITERIA</b>		
<b>Level of Service</b>	<b>Signalized Intersection Control Delay per Vehicle (seconds)</b>	<b>Unsignalized Intersection Control Delay per Vehicle (seconds)<sup>1</sup></b>
A	≤ 10.0	≤ 10.0
B	> 10.0 to 20.0	> 10.0 to 15.0
C	> 20.0 to 35.0	> 15.0 to 25.0
D	> 35.0 to 55.0	> 25.0 to 35.0
E	> 55.0 to 80.0	> 35.0 to 50.0
F	> 80.0	> 50.0

Note:  
1. LOS and delay at side-street stop-controlled intersection presented for minor approach only.  
Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

### ***Intersection Analysis***

#### Isolated Intersection Analysis

Except for intersections located in the vicinity of the Tamalpais Drive interchange (Intersection Numbers 1 through 8), signalized and unsignalized intersection delay and level of service was evaluated using the Traffix 7.8 software package.

#### Microsimulation Analysis

Isolated intersection analysis does not capture the effects of queue spillbacks between closely spaced intersections or turn pocket overflow, which will occur in the study area. The SimTraffic 6.0 software package captures these effects and allows for the inclusion of a detailed vehicle mix and driver behavior, creating a model reflective of the interaction between the study intersections. Operations at intersections along Tamalpais Drive near the interchange (Intersection Numbers 1 through 8) were analyzed using SimTraffic. Because SimTraffic

uses a stochastic assignment process, for each scenario, five model runs were performed and the average of these results is reported.<sup>3</sup>

#### *Microsimulation Model Calibration and Validation*

Adjustments to the lane change distances and driver behavior were made to better reflect existing conditions in the study area. Specifically, changes were made to better model PM peak hour conditions on Tamalpais Drive between the US-101 NB Ramps and San Clemente Avenue.

#### **Freeway Segment Operating Conditions**

Freeway segments on US Highway 101 are analyzed using volume-to-capacity (V/C) ratios. The capacities of the study freeway facilities were obtained from the 2000 Highway Capacity Manual (HCM). According to the HCM, for a freeway segment with minimum 12-foot travel lane widths, 6-foot shoulder widths, 2-foot median lateral clearance, a traffic stream composed entirely of passenger cars, interchange spacing greater than two miles, level terrain, and a driver population composed principally of regular users, the ideal freeway capacity is 2,400 vehicles per hour per lane. However, segments of US-101 through Corte Madera have many features that reduce the capacity flow rates from the ideal, including:

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

Therefore, the capacity of 2,200 vehicles per hour per lane was selected as an appropriate approximation of freeway lane capacity through Corte Madera. Through the study area, US-101 is 3-lanes in each direction with a high occupancy (HOV) lane in the peak direction. This analysis assumes a HOV lane capacity is 50% of a mixed-flow lane. Although an HOV lane has a lower vehicle flow rate, there is a higher passenger flow rate due to the increased number of passengers per vehicle. Table 3 summarizes the relationship between V/C and LOS for freeway segments.

<b>TABLE 3 FREEWAY SEGMENT LOS CRITERIA</b>		
<b>Level of Service</b>	<b>Description</b>	<b>Upper V/C Threshold</b>
A	Traffic Conditions	0.60
B	Little or no congestion	0.70
C	Small amount of traffic congestion	0.80
D	Average traffic congestion	0.90
E	High traffic congestion	1.00
F	Very high traffic congestion	>1.00

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

<sup>3</sup> Stochastic assignment is the assignment of a random seed number that defines the starting position of each vehicle in the network. Because each model run can vary slightly, multiple runs are conducted and the results are averaged.

## STUDY AREA AND FORECAST SCENARIOS

This analysis focuses on the following 19 intersections and seven freeway segments in the project vicinity which were selected with consultation from the Town of Corte Madera staff. The study area and study intersection locations are shown on Figure 1.

### **Study Intersections**

1. Tamalpais Drive / Madera Boulevard
2. Tamalpais Drive / Corte Madera Town Center Entrance
3. Tamalpais Drive / US 101 SB Off-Ramp
4. Tamalpais Drive / US 101 NB Off-Ramp
5. Tamalpais Drive / San Clemente Drive
6. Redwood Highway / Village at Corte Madera South Driveway
7. Redwood Highway / Village at Corte Madera Middle Driveway
8. Redwood Highway / Village at Corte Madera Northeast Driveway
9. Tamalpais Drive / Eastman Avenue
10. Madera Boulevard / Council Crest Drive / Tamal Vista Boulevard
11. Redwood Highway / Wornum Drive
12. Tamal Vista Boulevard / Wornum Drive
13. Tamal Vista Boulevard / Fifer Avenue
14. Lucky Drive / Fifer Avenue
15. Redwood Hwy / Industrial Way
16. Corte Madera Avenue / Redwood Avenue
17. Paradise Drive / San Clemente Drive
18. Paradise Drive / Harbor Avenue
19. Paradise Drive / El Camino Drive / Seawolf Passage

### **Freeway Segments**

1. Northbound US 101 South of Tamalpais Drive
2. Northbound US 101 North of Tamalpais Drive and South of Industrial Way
3. Northbound US 101 North of Industrial Way
4. Southbound US 101 North of Fifer Avenue
5. Southbound US 101 South of Fifer Avenue and North of Madera Boulevard
6. Southbound US 101 South of Madera Boulevard and North of Tamalpais Drive
7. Southbound US 101 South of Tamalpais Drive

### **Forecast Scenarios**

To assess the effects of project buildout on the existing transportation system, typical mid-week PM peak hour traffic conditions were studied.

In 2002, the Marin County Congestion Management Agency (CMA) completed an interim planning study identifying seven alternatives to meet current and future travel needs on US-101 at the Sir Francis Drake interchange. At that time, the Town of Corte Madera and City of Larkspur supported Alternative 4 in the Interim Planning Study which included construction of a new interchange at Wornum Drive.

The Transportation Authority of Marin (TAM) is now leading a subsequent effort to further develop a range of improvements for the Greenbrae Corridor between Tamalpais Drive and Sir Francis Drake Boulevard. This project was initiated in July 2006 and has developed additional alternatives that are being considered for the corridor. Because a preferred project alternative has not yet been identified, this report is limited to a discussion of potential effects that each US-101 alternative may have on vehicle circulation within Corte Madera.

Because the proposed General Plan consists primarily of retail land uses, and because few retail trips are generated during the AM peak period (7:00 – 9:00 AM), the PM peak period (4:00 – 6:00 PM) is the primary period of interest for this analysis. Thus, PM peak hour operating conditions were analyzed for the following scenarios:

1. Existing Conditions
2. Cumulative (Year 2025) plus proposed General Plan Buildout Conditions
3. Cumulative plus General Plan Buildout Alternative 1
4. Cumulative plus General Plan Buildout Alternative 2
5. Cumulative plus General Plan Buildout Alternative 3

## REPORT ORGANIZATION

This report is divided into five sections as described below:

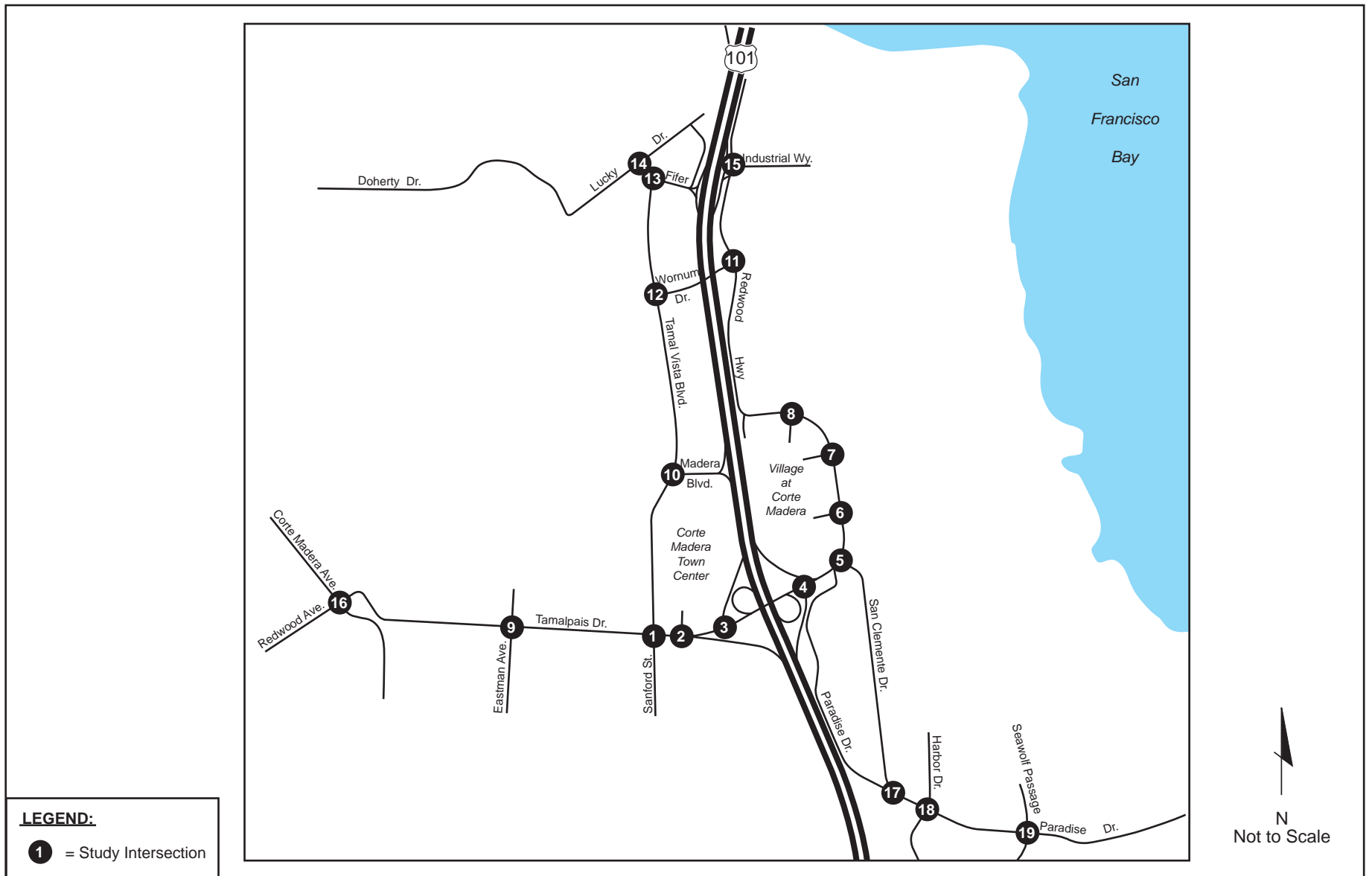
**Section 1 – Introduction** discusses the purpose and organization of this report.

**Section 2 – Existing Conditions** addresses existing conditions and intersection service levels.

**Section 3 – Proposed General Plan Conditions** presents relevant project information, such as project components and project trip generation, distribution, and assignment.

**Section 4 – Impact Analysis** addresses proposed General Plan impacts the existing circulation in the study area.

**Section 5 – Project Alternatives** presents relevant project information, such as project components and project trip generation, distribution, and assignment.



Corte Madera General Plan EIR

**STUDY AREA AND INTERSECTION LOCATIONS**

**FIGURE 1**

## 2. EXISTING CONDITIONS

### ENVIRONMENTAL SETTING

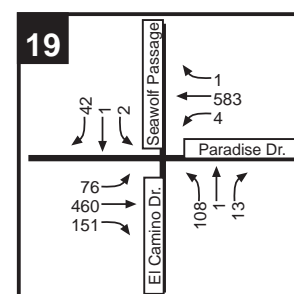
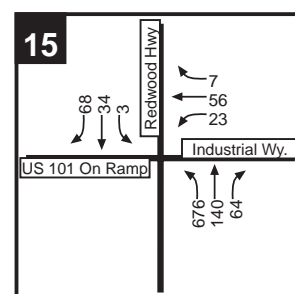
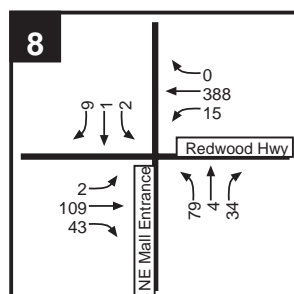
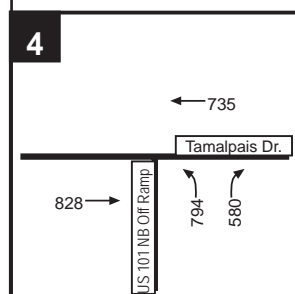
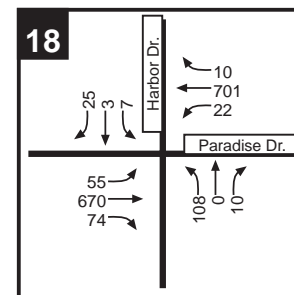
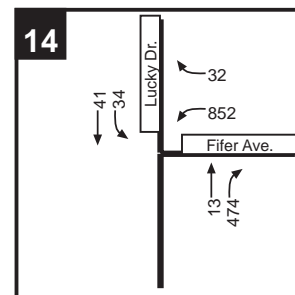
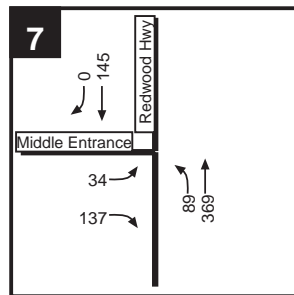
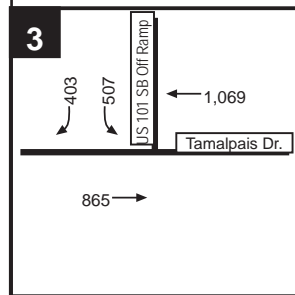
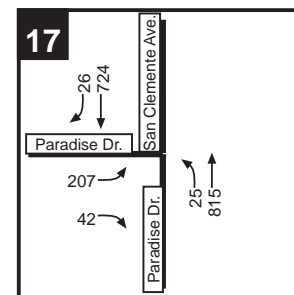
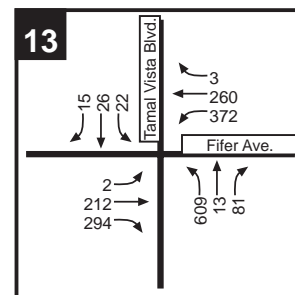
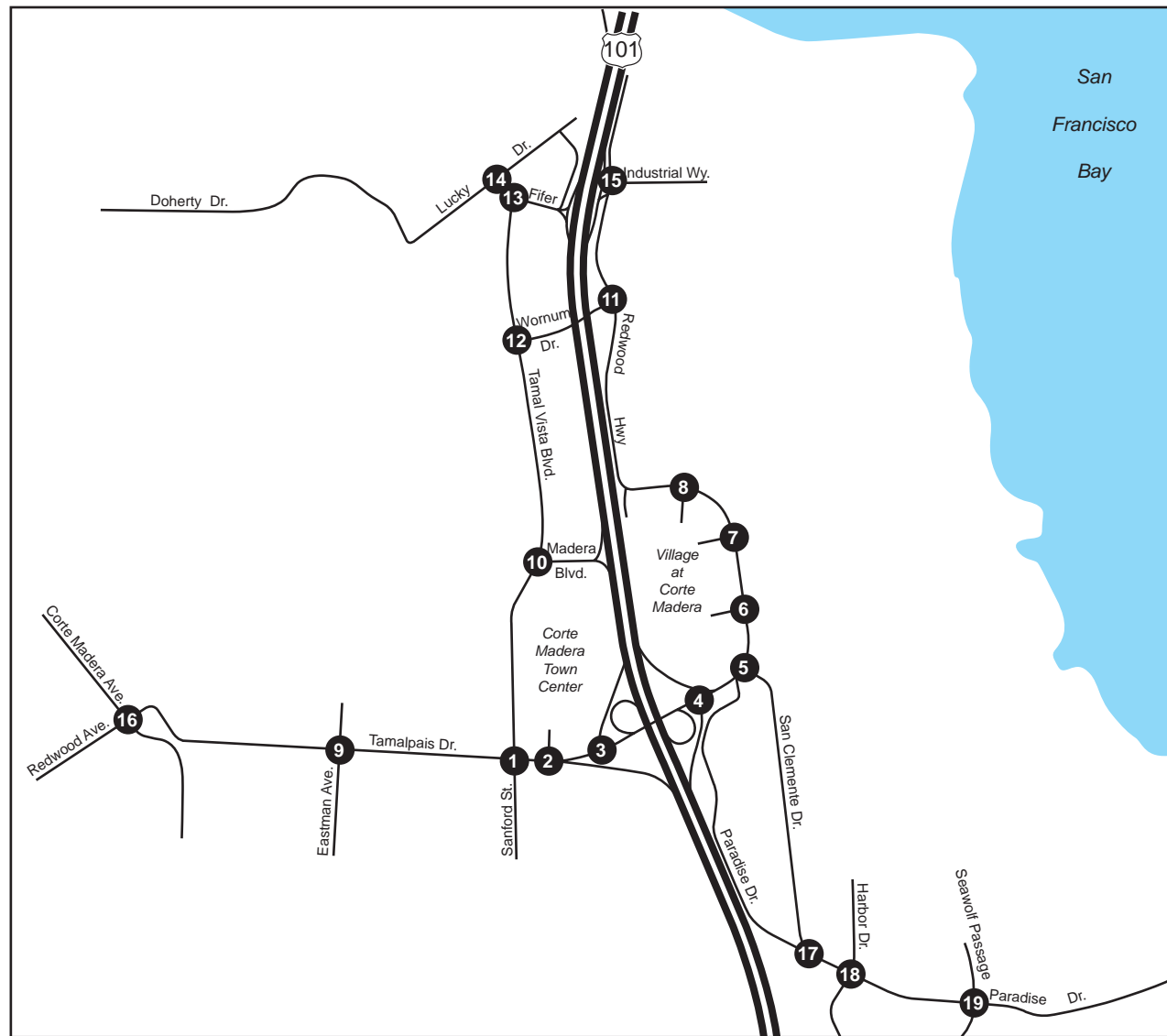
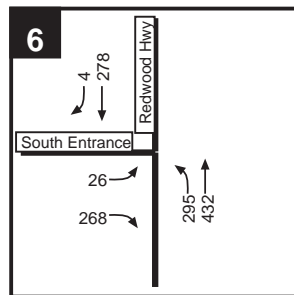
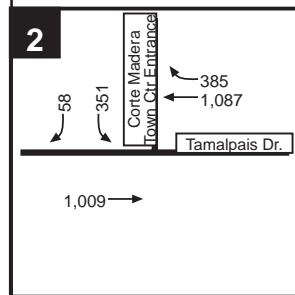
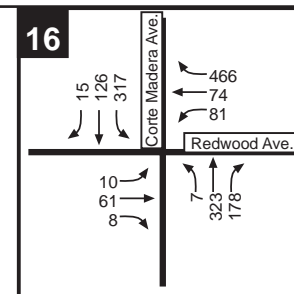
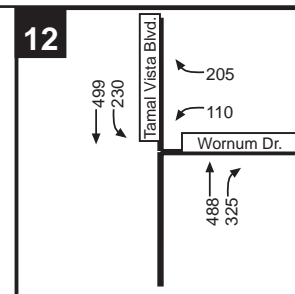
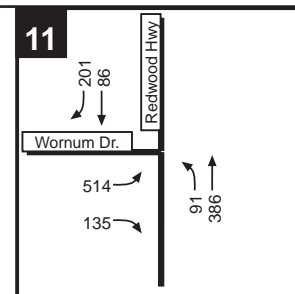
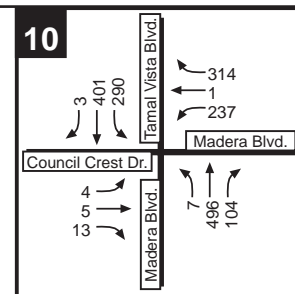
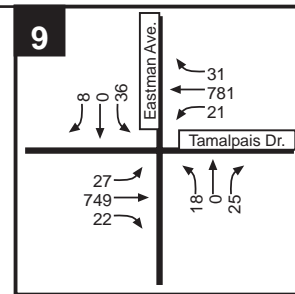
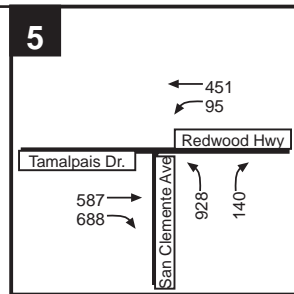
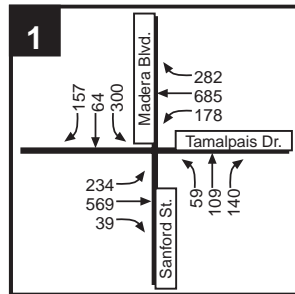
The circulation network serving Corte Madera consists of roadways, transit, bicycle and pedestrian facilities. US-101 serves as the primary route between San Francisco and Marin Counties, providing regional access to Corte Madera. Approximately 173,000 vehicles per day travel on US-101 within the corridor.

The Corte Madera street system is composed of arterial, collector, and local streets. The streets with the highest average daily traffic (ADT) are those in the vicinity of the Tamalpais Drive interchange, which provides the major east-west connection across the freeway and access to US-101.

### EXISTING CONDITIONS

#### *Intersection Operating Conditions*

Existing intersection operating conditions were analyzed using the methods, peak hour traffic volumes, lane configurations and control described above. The resulting delay and service levels are presented in Table 4. Existing PM peak hour traffic volumes are shown on Figure 2. Existing lane configurations and traffic control are shown on Figure A-1 (Appendix A).



**LEGEND:**  
 = Study Intersection



**TABLE 4  
EXISTING INTERSECTION OPERATING CONDITIONS**

Intersection	Control <sup>2</sup>	Delay <sup>3</sup>	LOS
1. Tamalpais Drive / Madera Boulevard	Signal	36	D
2. Tamalpais Drive / Corte Madera Town Center Entrance	Signal	7	A
3. Tamalpais Drive / US 101 SB Off-Ramp	Signal	10	A
4. Tamalpais Drive / US 101 NB Off-Ramp	Signal	13	B
5. Tamalpais Drive / San Clemente Drive	Signal	18	B
6. Redwood Highway / Village at Corte Madera South Driveway	Signal	9	A
7. Redwood Highway / Village at Corte Madera Middle Driveway	Signal	5	A
8. Redwood Highway / Village at Corte Madera Northeast Driveway	Signal	6	A
9. Tamalpais Drive / Eastman Avenue	Signal	9	A
10. Madera Boulevard / Council Crest Drive / Tamal Vista Boulevard	AWSC	>50	F
11. Redwood Highway / Wornum Drive	Signal	14	B
12. Tamal Vista Boulevard / Wornum Drive	Signal	13	B
13. Tamal Vista Boulevard / Fifer Avenue	Signal	36	D
14. Lucky Drive / Fifer Avenue <sup>3</sup>	SSSC	25 (2)	D (A)
15. Redwood Hwy / Industrial Way	Signal	14	B
16. Corte Madera Avenue / Redwood Avenue	Signal	25	C
17. Paradise Drive / San Clemente Drive	Signal	10	B
18. Paradise Drive / Harbor Avenue	Signal	11	B
19. Paradise Drive / El Camino Drive / Seawolf Passage	Signal	13	B

Note:

- Results for intersections 1-8 along the Tamalpais Drive corridor are based on microsimulation analysis
- Signal = Signalized Intersection; AWSC = All-way stop-controlled intersection; SSSC = Side-street stop-controlled intersection.
- Signalized and all-way stop-controlled intersection level of service based on weighted average control delay per vehicle, according to the Highway Capacity Manual (Transportation Research Board, 2000). For side-street stop controlled intersections, the LOS for the worst side-street movement is presented. Average intersection delay for all approaches is shown in parentheses.

Source: Fehr & Peers, September 2007.

Five of the 19 study intersections currently operate at LOS D, E, or F under existing PM peak hour conditions:

- Tamalpais Boulevard / Madera Boulevard
- Madera Boulevard / Council Crest Drive / Tamal Vista Boulevard
- Tamal Vista Boulevard / Fifer Avenue
- Lucky Drive / Fifer Avenue
- Corte Madera Avenue / Redwood Avenue

### Freeway Operating Conditions

US-101 currently has three mixed-flow travel lanes and one peak-direction HOV lane in each direction. Existing PM peak hour traffic volumes were obtained from a count conducted in late 2004 and compared with Caltrans' published freeway volumes for year 2003. According to the data, the worst-case condition for freeway segments in this area is the PM peak hour. Using the peak-hour volumes and theoretical freeway peak-hour capacities, the V/C ratio for each segment was calculated by dividing the actual traffic volumes by the theoretical capacity. This ratio was used to calculate the segment LOS.

The existing conditions freeway volumes as well as the theoretical capacity of each segment, the resulting V/C ratio, and the resulting LOS are depicted in Table 5. As shown, northbound US-101 experiences congestion throughout Corte Madera during the PM peak hour, while southbound traffic is relatively uncongested.

**TABLE 5  
EXISTING FREEWAY SEGMENT OPERATING CONDITIONS**

Direction	Freeway Segment	Theoretical Capacity <sup>1</sup>	Existing		
			Demand Volume <sup>2</sup>	V/C <sup>3</sup>	LOS
Northbound US 101	South of Tamalpais Drive	8,800	7,790	0.89	D
	North of Tamalpais Drive, South of Industrial Way	7,700	7,600	0.99	E
	North of Industrial Way <sup>4</sup>	8,800	8,070	0.92	E
Southbound US 101	North of Fifer Avenue	8,800	6,710	0.76	C
	South of Fifer Avenue, North of Madera Boulevard	8,800	6,390	0.73	C
	South of Madera Boulevard, North of Tamalpais Drive	8,800	6,230	0.71	C
	South of Tamalpais Drive	8,800	6,290	0.71	C

Notes:

1. Assumes a mixed flow freeway capacity of 2,200 vehicles per hour per lane. HOV lane (peak direction only) capacity is 50% of a mixed flow freeway lane. Auxiliary lane capacity is 50% of a mixed flow freeway lane.
2. To account for downstream bottlenecks, traffic demand volume is used for determining the volume to capacity ratio. Demand volume is calculated based on actual freeway counts plus queued vehicles upstream of a given bottleneck location. During the afternoon peak hour, 570 vehicles are estimated to be queued upstream of the northbound US-101 bottleneck location just south of the Sir Francis Drake Boulevard on-ramp. This estimate is based on queue length and vehicle density observations conducted during the afternoon peak hour.
3. Freeway segment level of service based on volume to capacity ratio according to the Highway Capacity Manual (Transportation Research Board, 2000). *Highway Capacity Manual*, Transportation Research Board, 2000.
4. Capacity immediately north of Industrial Way on-ramp based on a configuration of 1 HOV lane, 3 mixed flow lanes, and 1 auxiliary lane. PM peak hour congestion on northbound US-101 is generally due to two bottlenecks outside the study area: the loss of one mixed flow lane just south of the Sir Francis Drake on-ramp and the US-101/I-580 interchange in San Rafael. When completed, the US-101 HOV Gap Closure project is expected to reduce northbound congestion at these locations.

Source: Fehr & Peers, September 2007.

### Public Transit

The Town of Corte Madera is served by several public transit providers. Existing transit routes in Corte Madera are shown on Figure 3.

### Marin County Transit District

The Marin County Transit District (MCTD) is responsible for providing local transit service within Marin County. MCTD directly operates some transit routes, but it also contracts other providers, including Golden Gate Transit and Whistlestop Wheels, for local bus and paratransit services. The Twin Cities Shuttle (Route 221) is a weekday, local shuttle in the Corte Madera and Larkspur areas operated by MCTD. The route connects the Village at Corte Madera and Corte Madera Town Center with Downtown Larkspur, Redwood High School, and the Larkspur Ferry Terminal.

### Golden Gate Bridge, Highway and Transportation District

The Golden Gate Bridge, Highway and Transportation District provides bus and ferry service to the study area. The Larkspur Ferry Terminal and the San Rafael Transit Center serve as major hubs and transfer points to the system.

#### *Golden Gate Transit*

Golden Gate Transit (GGT) operates bus service in Marin, San Francisco, and Sonoma counties. GGT provides basic and commuter service between Marin County and San Francisco as well as local service within Marin County. GGT Routes 18 and 22 operate in Corte Madera along Corte Madera Avenue and Tamalpais Drive. Additionally, several regional routes operate on US-101 and provide service to the bus pads at the Lucky Drive and Tamalpais Drive interchanges. Whistlestop Wheels is the paratransit service for GGT.

#### *Golden Gate Ferry*

The Golden Gate Ferry is a heavily used commuter service to San Francisco. The ferry operates with 20-30 minute headways during peak commute hours, and takes 30 minutes to cross the bay.

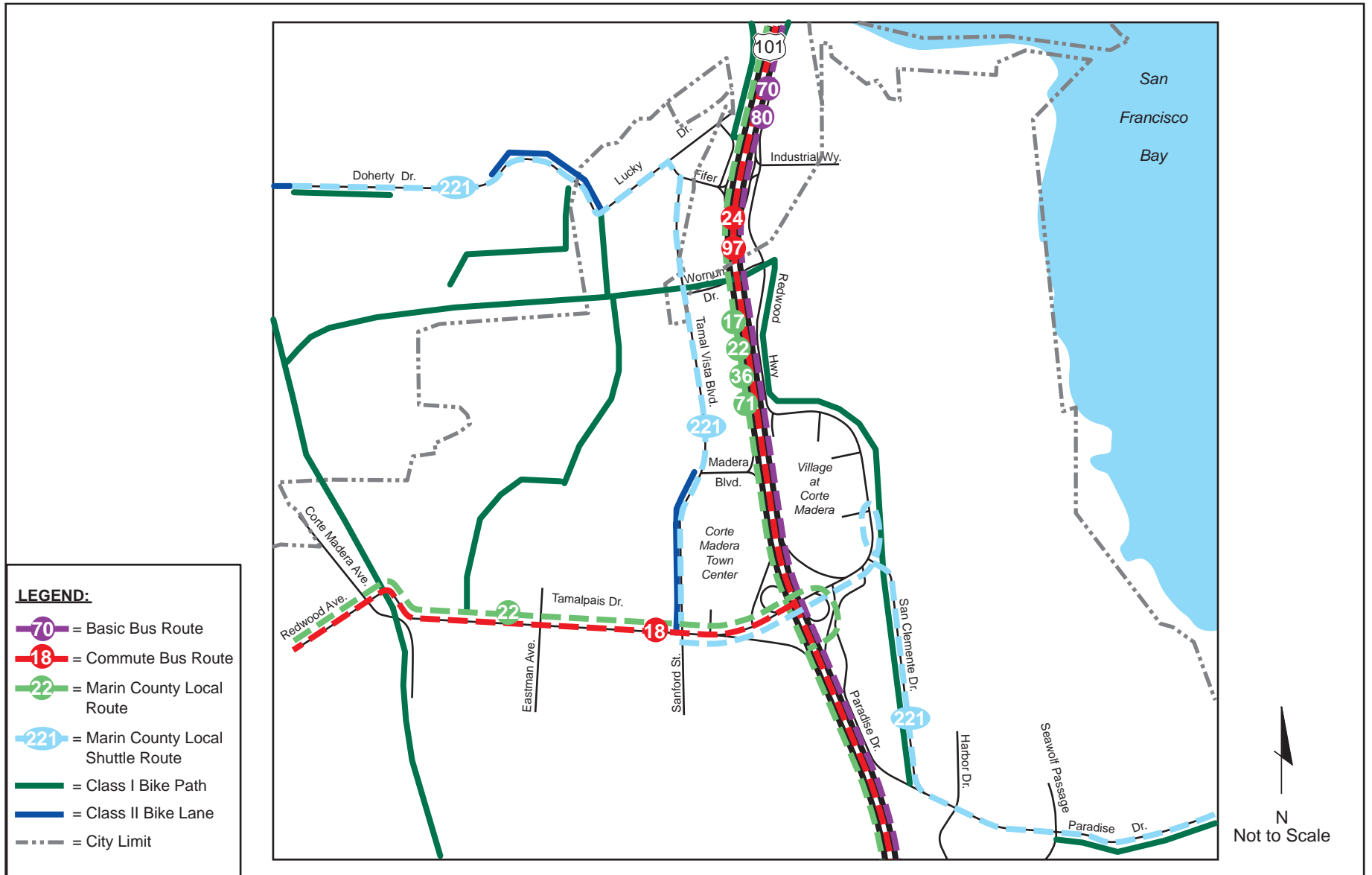
### Sonoma Marin Area Rail Transportation District

No passenger rail service currently exists in Corte Madera or nearby communities. In 2003, the Sonoma-Marín Area Rail Transit (SMART) District was established to oversee the future development and implementation of passenger rail service on the Northwestern Pacific Railroad corridor. The SMART District is charged with planning, engineering, evaluating and implementing passenger train service along a 70-mile corridor from Cloverdale to Larkspur.

### ***Bicycle and Pedestrian Facilities***

Residents of Corte Madera value non-motorized mobility, and the town has a significant amount of pedestrian and bicycle activity. There are existing pedestrian facilities in the area, but there are limitations and discontinuities in the pedestrian network.

The Town's pedestrian network consists of sidewalks, trails and street crossings. In some locations pedestrians share the street with motor vehicles and bicyclists. Corte Madera has many areas that are especially conducive to walking for recreation and transportation. Several miles of bicycle lanes and paths exist within Corte Madera, providing an important connection to destinations within the Town. Existing bicycle facilities are shown on Figure 3.



Corte Madera General Plan EIR

## REGULATORY SETTING

The Town of Corte Madera has jurisdiction over all Town streets and Town-operated traffic signals. State Routes, including US-101, are under the jurisdiction of the California Department of Transportation (Caltrans). Public transit agencies with operations in the Town of Corte Madera are the Marin County Transit District and Golden Gate Transit. In addition, there are several regional agencies with jurisdiction related to transportation in Corte Madera.

### Transportation Authority of Marin

The Transportation Authority of Marin (TAM) is designated as the Marin Congestion Management Agency (CMA) to address Marin County transportation issues and to fulfill the legislative requirements of Propositions 111 and 116, approved in June 1990. The agency was created for the purpose of administering the sales tax Measure A. The Authority is responsible for programming funding for all transportation programs in Marin County.

### Metropolitan Transportation Commission

The majority of federal, state, and local financing available for transportation projects is allocated at the regional level by the Metropolitan Transportation Commission (MTC), the transportation planning, coordinating, and financing agency for the nine-county Bay Area. The current regional transportation plan, known as Transportation 2030, was adopted by MTC on February 23, 2005. Transportation 2030 specifies a detailed set of investments and strategies throughout the region from 2005 through 2030 to maintain, manage, and improve the surface transportation system. The Plan specifies how anticipated federal, state, and local transportation funds will be spent in the Bay Area during the next 25 years. Most of this “committed funding” will go toward protecting the region’s existing transportation infrastructure. Improvements to the US-101 / Greenbrae interchange are included in the 2030 Regional Transportation Plan as a Regional Measure 2 funded project.

### Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) is the regional agency with the authority to develop and enforce regulations for the control of air pollution throughout the Bay Area. The Clean Air Plan is BAAQMD’s plan for reducing the emissions of air pollutants that lead to ozone. BAAQMD has also published CEQA Guidelines for the purpose of evaluating the air quality impact of projects and plans. One of the criteria that the Guidelines describe is that plans, including General Plans, must demonstrate reasonable efforts to implement transportation control measures included in the Clean Air Plan that identify local governments as the implementing agencies. On-road motor vehicles are the largest source of air pollution in the Bay Area. To address the impact of vehicles, the California Clean Air Act requires air districts to adopt, implement, and enforce transportation control measures.

### 3. PROPOSED GENERAL PLAN CONDITIONS

#### PROJECT DESCRIPTION

Buildout of the proposed Corte Madera General Plan, also referred to as “the project,” includes development of vacant and underutilized parcels as currently allowed under the Town’s existing General Plan, expansion of the Village at Corte Madera and the Corte Madera Town Center shopping centers from an existing floor-area ratio (FAR) of approximately 0.3-0.4 to an FAR of 0.6, and development of two parcels at Paradise Drive and San Clemente Drive. The Corte Madera Town Center and Village at Corte Madera are located north of Tamalpais Drive to the west and east of Highway 101 respectively.

#### PLANNED ROADWAY IMPROVEMENTS

##### *US-101 Greenbrae Corridor Improvements*

In 2002 the Marin County Congestion Management Agency (CMA) completed an Interim Planning Study identifying seven alternatives to meet current and future travel needs on US-101 at the Sir Francis Drake interchange. In 2002, the Town of Corte Madera and City of Larkspur adopted resolutions supporting Alternative 4 from the Interim Planning Study, which included construction of a new freeway interchange at Wornum Drive.

TAM is currently leading a subsequent effort to further develop a range of improvements for the Greenbrae Corridor between Tamalpais Drive and Sir Francis Drake Boulevard. This project, funded through Regional Measure 2, was initiated in July 2006 and has resulted in the development of additional alternatives that are being considered for the corridor. Because a preferred alternative has not yet been identified, these improvements are not assumed as part of proposed General Plan buildout conditions.

As part of the TAM study, several options for US-101 corridor improvements were presented at a Public Workshop in March 2007.<sup>4</sup> These options were grouped by travel direction on US-101 (i.e. northbound and southbound). Additionally, potential improvements to the Tamalpais Drive interchange and options for the Central Marin bicycle/pedestrian Ferry Connection (CMFC) were presented. These alternatives are described below:

##### Southbound US-101 Alternatives

- **Southbound Option A:** This option would include the construction of a frontage road parallel to southbound US-101 between the Sir Francis Drake Boulevard on-ramp and the Madera Boulevard off-ramp. The road would be one-way and would require traffic entering the freeway from Sir Francis Drake Boulevard to proceed through a signalized intersection at Lucky Drive before merging onto the freeway. The frontage road would serve as an alternate route for traffic that currently travels southbound on Tamal Vista Boulevard.
- **Southbound Option B:** This option would include the construction of a new southbound on- and off-ramp at Wornum Drive. Additionally, a frontage road connection would be built between Wornum Drive and Madera Boulevard. Because this option would close the current freeway ramps at Lucky Drive, there would be some increase in traffic using Wornum Drive and Tamal Vista Boulevard north of Wornum Drive.
- **Southbound Option C:** Southbound Option C would be similar to Option B but would also include grade-separated, or “braided”, Sir Francis Drake on-ramp and Wornum Drive off-ramp. While this would reduce

<sup>4</sup> Options presented in 2007 have subsequently been revised and were presented at another workshop in March 2008. As of August 2008, additional evaluation and screening of alternatives is currently in progress.

freeway “weaving” conflicts between entering and exiting freeway traffic on southbound US-101, traffic patterns on local streets would be similar to Option B.

- **Southbound Option D:** This Option would make improvements to the Sir Francis Drake on-ramp by widening the ramp and closing the southbound off-ramp to Lucky Drive. Traffic bound for Lucky Drive would exit US-101 upstream at Sir Francis Drake Boulevard and travel along the widened Sir Francis Drake on-ramp. This option would improve freeway weaving operations between Sir Francis Drake and Lucky Drive. Traffic patterns on local streets would likely be similar to existing patterns with this alternative.

#### Northbound US-101 Alternatives

- **Northbound Option A:** This option would include the construction of a new northbound on- and off-ramp at Wornum Drive and would close the existing ramps at Industrial Avenue. While this option would allow traffic entering the freeway at Wornum Drive to merge directly onto US-101 instead of traveling through the Sir Francis Drake Boulevard interchange, there is a potential that this will create freeway weaving issues between Wornum Drive and Sir Francis Drake Boulevard.
- **Northbound Option B:** This option would be similar to Option A but would include a roundabout intersection at Wornum Drive. Due to projected traffic volumes, it would need to be configured as a double-lane roundabout. Because this intersection also includes a bicycle/pedestrian trail crossing, installation of a double-lane roundabout may make street crossings for bicyclists and pedestrians more challenging.
- **Northbound Option C:** Northbound Option C would include the construction of a new northbound on- and off-ramp at Wornum Drive, though the on-ramp would function similar to a loop on-ramp in the southeast quadrant of the interchange. This would improve traffic operations along Wornum Drive but would still create potential freeway weaving issues between Wornum Drive and Sir Francis Drake Boulevard.
- **Northbound Option D:** Northbound Option D would reconfigure the northbound Industrial Avenue on-ramp to provide direct access to northbound US-101. This option would eliminate the need for traffic entering the freeway at Industrial Drive to travel through the Sir Francis Drake / US-101 Northbound Ramps intersection in order to access US-101. Instead, a structure would be built over the Sir Francis Drake / US-101 Northbound Ramp intersection that would provide direct access to the freeway.

#### Tamalpais Drive Alternatives

Alternatives for Tamalpais Drive were developed as part of the Tamalpais Drive Interchange Planning Study in January 2007. These alternatives focus in improvements to the Tamalpais Interchange that will improve conditions for all travel modes, including bicyclists, pedestrians, transit users, and motorists. Options for reconfiguring Tamalpais Drive include:

- **Option A – Realignment and Intersection Modifications:** Option A would realign the southbound and northbound diagonal on-ramps at the Tamalpais Interchange as a way of improving bicycle and pedestrian conditions and reducing potential conflicts. Bicycle lanes would be striped along the overpass, and pedestrian crossing locations would be upgraded. Improvements to the San Clemente Drive / Tamalpais Drive and Madera Boulevard / Tamalpais Drive intersections are also included as part of Option A.
- **Option B – Widen North Side of Tamalpais:** Option B would include all improvements that are part of Option A, but it would also widen the Tamalpais Interchange structure to accommodate a sidewalk on the

north side of the roadway. The southbound loop on-ramp would also be reconfigured to reduce bicycle and pedestrian conflicts.

- **Option C – Full Reconstruction:** Option B would result in the full reconstruction of the interchange and ramps as a “tight diamond” layout. This would require a substantial investment and would result in a substantially wider structure than exists today because left turn lanes would be necessary with a tight diamond configuration.

#### Central Marin Ferry Connection Multi-Use Path

- **New Multi-Use Path:** Also part of the Greenbrae Corridor study is a connection to the Larkspur Ferry Terminal. This path would be constructed across Corte Madera Creek and enable residents of Corte Madera to have a direct connection to the Ferry Terminal. If this connection is built, it may increase the number of ferry commuters accessing the terminal via non-auto modes.

#### **US-101 HOV Gap Closure Project**

Caltrans is currently constructing the US-101 HOV gap closure project. This project recently extended HOV lanes northward from Corte Madera to San Rafael. Over next 3 years, HOV lanes will connect to existing lanes north of San Rafael as part of this project. Cumulative lane configurations and traffic control at project study intersections are shown on Figure A-2 (Appendix A).

### **CUMULATIVE (YEAR 2025) TRAFFIC VOLUMES**

Cumulative traffic forecasts for 2025 were developed based on a travel demand and trip assignment model using the VISUM software program. The Corte Madera Travel Demand Model, based on the Marin County travel demand model, was developed to aid in assessing changes in traffic patterns that will result from anticipated roadway network changes and buildout of the proposed General Plan. Model development and calibration results are included in Appendix B.

#### **Project Trip Generation**

A full retail expansion at the Corte Madera Town Center and Village at Corte Madera was assumed in this analysis. Office land use was assumed for potential development at Paradise Drive and San Clemente Avenue. Based on these assumptions, buildout of the proposed General Plan would consist of the following land use changes:

- 645 ksf of additional retail land use, beyond uses currently permitted under the existing General Plan
- 14 ksf of additional office land use, beyond uses currently permitted under the existing General Plan

While the proposed General Plan Implementation Program LU-4.3a promotes establishing a mix of land uses at the Town Center and Village shopping centers, this analysis assumes all expansion would be retail in nature. Because retail land uses generate more vehicle trips per square foot than office or residential uses, the results shown below represent a “worst case” scenario. Analysis of a worst case condition is consistent with CEQA guidelines. Establishing a mix of land uses at the Village and Town Center, instead of only retail uses, would result in a lower number of vehicle trips being generated.

Trips generated by buildout of the proposed General Plan are shown in Table 6. Trips were estimated based on trip generation equations presented in ITE Trip Generation, 7<sup>th</sup> Edition and represent the net difference in trips between the existing 1989 General Plan and the proposed General Plan.

**TABLE 6  
NET CHANGE IN VEHICLE TRIPS WITH PROPOSED GENERAL PLAN**

Description	Size	Daily Trips	AM Peak Hour Trips	PM Peak Hour Trips
<i>Village at Corte Madera, Corte Madera Town Center, Koch Road Area Land Use Changes</i>	659 ksf	15,800	330	1,510

Source: Fehr & Peers, 2007.

Note: Numbers represent the additional trips with buildout of the proposed General Plan, compared to buildout of the currently adopted 1989 General Plan

### ***Project Trip Distribution and Assignment***

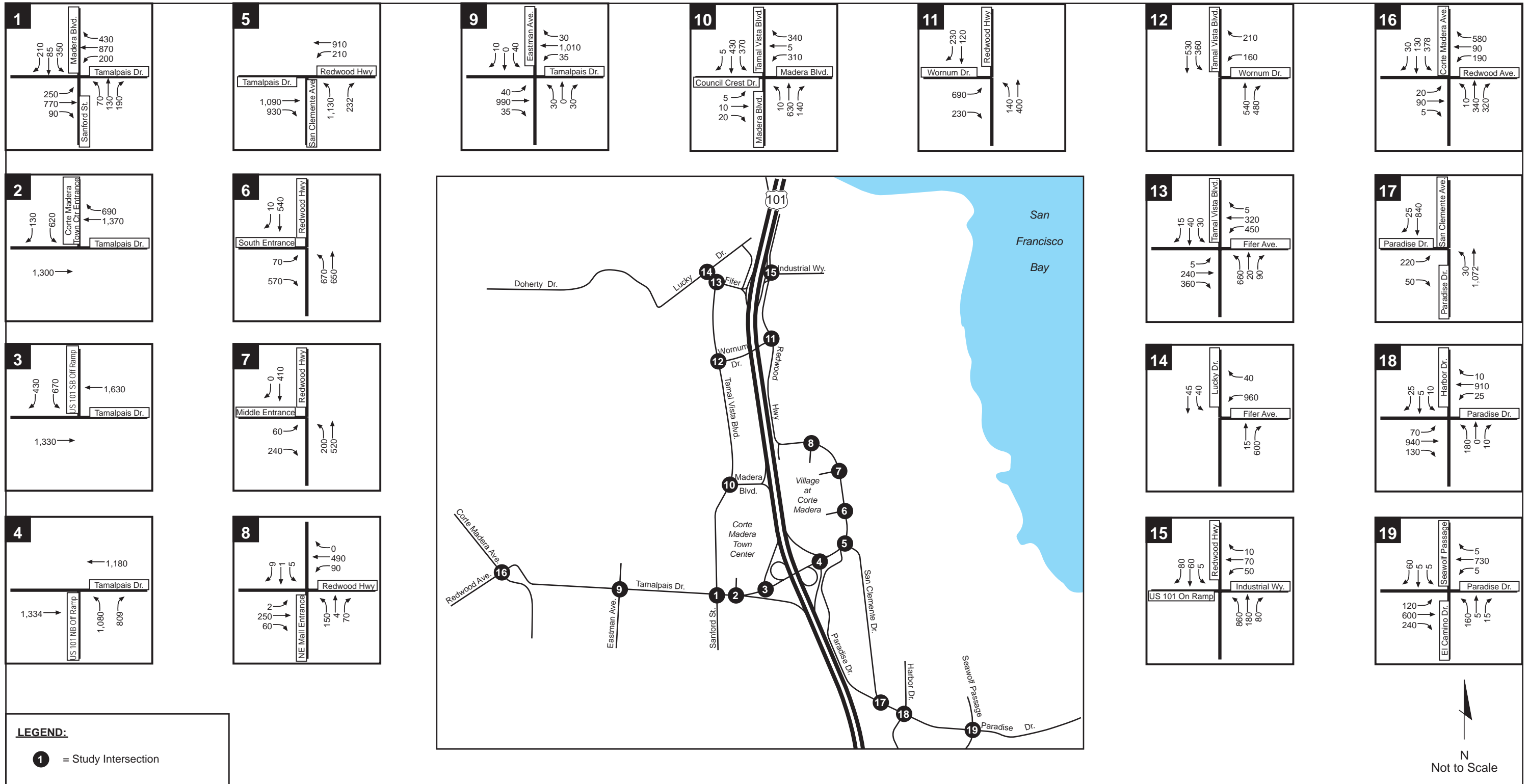
Trip distribution for the net new trips was developed based on existing traffic patterns and the location of nearby residential populations. Inbound and outbound trip distribution for the Village at Corte Madera and the Corte Madera Town Center are shown on Figure A-3 (Appendix A). Cumulative project trip assignment is shown on Figure A-4 (Appendix).

### **PROPOSED GENERAL PLAN OPERATING CONDITIONS**

To obtain with project conditions, traffic generated by the proposed project was assigned to the roadway network and added to without project conditions.

### ***Intersection Operating Conditions***

PM peak hour traffic volumes with the proposed General Plan are shown on Figure 4. Future intersection lane configurations and traffic control are expected to remain the same as existing conditions. Table 7 shows cumulative intersection operating conditions with buildout of the proposed General Plan.



**TABLE 7 – INTERSECTION LEVELS OF SERVICE FOR PROPOSED GENERAL PLAN**

Intersection <sup>1,2</sup>	Existing Conditions		Project (Proposed General Plan)	
	Delay (sec)	LOS	Delay (sec)	LOS
1. Tamalpais Drive / Madera Boulevard	36	D	>80	F
2. Tamalpais Drive / Corte Madera Town Center Entrance	7	A	17	B
3. Tamalpais Drive / US 101 SB Off-Ramp	10	A	74	E
4. Tamalpais Drive / US 101 NB Off-Ramp	13	B	>80	F
5. Tamalpais Drive / San Clemente Drive	18	B	57	E
6. Redwood Highway / Village at Corte Madera South Driveway	9	A	17	B
7. Redwood Highway / Village at Corte Madera Middle Driveway	5	A	7	A
8. Redwood Highway / Village at Corte Madera Northeast Driveway	6	A	9	A
9. Tamalpais Drive / Eastman Avenue	9	A	9	A
10. Madera Boulevard / Council Crest Drive / Tamal Vista Boulevard	>50	F	>50	F
11. Redwood Highway / Wornum Drive	14	B	16	B
12. Tamal Vista Boulevard / Wornum Drive	13	B	17	B
13. Tamal Vista Boulevard / Fifer Avenue	36	D	43	D
14. Lucky Drive / Fifer Avenue <sup>3</sup>	25 (2)	D (A)	29 (3)	F (A)
15. Redwood Hwy / Industrial Way	14	B	18	B
16. Corte Madera Avenue / Redwood Avenue	25	C	31	C
17. Paradise Drive / San Clemente Drive	10	B	10	B
18. Paradise Drive / Harbor Avenue	11	B	12	B
19. Paradise Drive / El Camino Drive / Seawolf Passage	13	B	15	B

Notes:  
<sup>1</sup> Results from intersections 1-8 along the Tamalpais Drive corridor are based on microsimulation analysis.  
<sup>2</sup> All intersections are signalized except #14 Fifer/Lucky, which is SSSC, and #10 Council Crest & Madera/Tamal Vista, which is AWSC.  
<sup>3</sup> Signalized and all-way stop-controlled intersection level of service based on weighted average control delay per vehicle, according to the Highway Capacity Manual (Transportation Research Board, 2000). For side-street stop controlled intersections, the LOS for the worst side-street movement is presented.  
Source: Fehr & Peers, September 2007.

### Freeway Segment Operating Conditions

Cumulative plus General Plan Buildout freeway segment operating conditions were analyzed by adding the project volumes to the Cumulative without project scenarios. Table 7 shows Cumulative plus Project freeway segment operating conditions.

TABLE 8 CUMULATIVE PLUS PROJECT FREEWAY SEGMENT OPERATING CONDITIONS								
Direction	Freeway Segment	Theoretical Capacity <sup>1</sup>	Existing			Proposed General Plan		
			Volume	V/C <sup>2</sup>	LOS	Volume	V/C <sup>2</sup>	LOS
Northbound US 101	South of Tamalpais Drive	8,800	7,790	0.89	D	8,580	0.98	E
	North of Tamalpais Drive, South of Industrial Way	7,700	7,600	0.99	E	<b>8,210</b>	<b>1.07</b>	<b>F</b>
	North of Industrial Way	8,800	8,070	0.92	E	<b>8,930</b>	<b>1.01</b>	<b>F</b>
Southbound US 101	North of Fifer Avenue	8,800	6,710	0.76	C	8,290	0.94	E
	South of Fifer Avenue, North of Madera Boulevard	8,800	6,390	0.73	C	7,800	0.89	D
	South of Madera Boulevard, North of Tamalpais Drive	8,800	6,230	0.71	C	7,920	0.90	D
	South of Tamalpais Drive	8,800	6,290	0.71	C	8,060	0.92	E

Notes:

- Assumes a mixed flow freeway capacity of 2,200 vehicles per hour per lane. HOV lane (peak direction only) capacity is 50% of a mixed flow freeway lane. Auxiliary lane capacity is 50% of a mixed flow lane.
- Freeway segment level of service based on volume to capacity ratio according to the Highway Capacity Manual (Transportation Research Board, 2000). *Highway Capacity Manual*, Transportation Research Board, 2000.

Source: Fehr & Peers, September 2007.

## 4. IMPACT ANALYSIS

### SIGNIFICANCE CRITERIA

Impacts of buildout of the proposed General Plan would be significant if they:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the V/C ratio for freeways, or congestion at intersections);
- Exceed, either individually or cumulatively, a level of service (LOS) standard established by the county Congestion Management Agency<sup>5</sup> or Town of Corte Madera for designated roads or highways;
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards due to a design feature (i.e., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access;
- Result in inadequate parking capacity; or
- Conflict with adopted policies, plans, or programs supporting alternative transportation

Based on the Town of Corte Madera's current transportation impact criteria, the above general significance criteria are interpreted as follows in evaluating the proposed General Plan:

*Town Roadway and Intersection Impact Criteria.* The following significance criteria are from the 1989 Town of Corte Madera General Plan:

- **Guiding Policy 5.1.g.** Establish a standard for intersection operations of 0.79 volume/capacity ratio (LOS C) or better where maintenance or attainment of this standard is feasible.<sup>6</sup>

*As shown on Table 7, six intersections are projected to operate below LOS C at Plan build-out. In 1987 all except Tamal Vista Boulevard / Fifer Avenue and Redwood Avenue / Corte Madera Avenue were at LOS C or better. Acceptable engineering solutions are not available to improve operations at Madera Boulevard / Town Center and Tamal Vista Boulevard / Fifer Avenue. The intersection at Redwood Avenue / Corte Madera Avenue is included in the Village Square study area and will be improved consistent with the Specific Plan to be prepared.*

*Most intersections are projected to operate at LOS A, B, or C at Plan build-out. Degradation of service at these intersections is to be controlled through Implementing Policies 5.1.i and 5.1.j.*

<sup>5</sup> No streets within Corte Madera are part of the 2005 Congestion Management Program network of transportation facilities

<sup>6</sup> The standard for intersection operations under the proposed General Plan would be LOS D. This analysis uses the currently-adopted standard of LOS C to identify potential impacts but recognizes that the proposed standard of LOS D will result some locations being mitigated by this change in policy.

- **Implementing Policy 5.1.i.** Minimize intrusion of vehicular traffic in residential neighborhoods.
- **Implementing Policy 5.1.j.** Design road improvements to preserve small-town scale and maintain the natural appearance of the surrounding hills and ridges.

*US-101 Impact Criteria.* Significant traffic impacts on freeway segments are identified as when a project causes:

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

The 2005 Marin Congestion Management Program (CMP) identifies the studied freeway segments as "grandfathered" roadway segments. These roadway segments were operating at a lower LOS than the standard at the time of its implementation in 1991 and are allowed to continue to operate at a lower LOS standard level until such time as they are improved or the traffic load is diverted. A roadway's designation as "grandfathered" does not affect this analysis, but it provides context for why some roadways operate at a substandard level.

*Design Review Considerations.* A roadway design impact is considered significant when:

1. A project introduces a design feature that presents safety concerns.

*Emergency Access Impact Criteria.* An emergency vehicle access impact is considered to be significant if it would:

1. Provide inadequate design features to accommodate emergency vehicle access and circulation.

*Pedestrian Impact Criteria.* A pedestrian impact is considered significant if it would:

1. Disrupt existing pedestrian facilities;
2. Interfere with planned pedestrian facilities; or
3. Create inconsistencies with adopted pedestrian system plans, guidelines, policies or standards.

*Bicycle Impact Criteria.* A bicycle impact is considered significant if it would:

1. Disrupt existing bicycle facilities;
2. Interfere with planned bicycle facilities;
3. Conflict or create inconsistencies with adopted bicycle system plans, guidelines, policies or standards; or
4. Not provide secure and safe bicycle parking in adequate proportion to anticipated demand.

*Transit Impact Criteria.* A transit impact is considered significant if it would:

1. Result in a significant unanticipated increase in transit patronage; or
2. Result in development that is inaccessible to transit riders.

### **Transportation/Traffic Issues not Further Analyzed**

Due to the nature and scope of the proposed project (adoption of 2025 General Plan), implementation of the project would not have the potential to result in a change in air traffic patterns at any airport in the area. No further analysis of this issue is required.

Since this analysis focuses on plan-level impacts (rather than the specific design of facilities) there is no analysis of impacts related to emergency response or hazards.

### **Methodology and Assumptions**

Impacts are assessed based upon comparison between existing conditions (based on data collected from 2004 to 2005) and future (Year 2025) with project conditions. For purposes of this EIR, future with project conditions are based on forecasted Year 2025 land uses and transportation improvements described in the proposed Corte Madera General Plan.

The freeway analysis of US-101 examined LOS of the main through lanes. Although an assessment of merge / diverge movements and ramp operations can be useful in analyzing traffic operations, not all information was available to conduct this analysis. However, the mainline analysis is considered adequate for characterizing the transportation and circulation impacts of the proposed General Plan.

## **IMPACT SUMMARY**

This section describes the potential impacts on the transportation system resulting from buildout of the land uses described in the proposed 2025 General Plan in conjunction with the transportation improvements and policies that are described in the General Plan Circulation Element.

### Future Intersection Operations

LOS was forecast at each of the 19 study intersections. Lane geometries with buildout of the Corte Madera General Plan are shown in Appendix A. The city-wide travel demand forecasting model was used to generate traffic volume forecasts resulting from implementation of the proposed General Plan, as described in Appendix B. This data was used to determine the peak LOS rating, or hour, when the highest number of vehicles passed through the intersection during each commute period.

Impacts to study intersections would occur at the following four locations that would deteriorate from an acceptable LOS (C or better) under existing conditions to an unacceptable LOS (D or worse based on the 1989 General Plan standard) under future conditions with buildout of the proposed General Plan during the PM peak hour:

- Tamalpais Drive / Madera Boulevard
- Tamalpais Drive / US 101 SB Off-Ramp
- Tamalpais Drive / US 101 NB Off-Ramp
- Tamalpais Drive / San Clemente Drive

At the following three study intersections, intersection operations are unacceptable under existing conditions and will not deteriorate to a lower level of service under Cumulative with Project conditions:

- Madera Boulevard / Council Crest Drive / Tamal Vista Boulevard

- Tamal Vista Boulevard / Fifer Avenue
- Lucky Drive / Fifer Avenue

#### Freeway Operations

US-101 currently operates at or near capacity on several freeway segments in the Corte Madera area. The future analysis includes the completion of the US-101 HOV lane Gap Closure project, which is fully funded and will change freeway lane configurations to the north of Corte Madera. However, even with continuous HOV lanes on US-101 north of San Rafael, increased regional travel demand will result in northbound US-101 remaining over capacity for multiple segments in the PM peak hour.

Southbound freeway operations are forecast to operate acceptably (LOS E or better) and no significant impacts on freeway operations would occur on segments within Corte Madera.

#### Public Transit

While transit does not currently play a major role for travel within Corte Madera, the proposed General Plan seeks to foster increased transit use and a greater emphasis on transit in planning for future transportation. In the long term, this could include increased frequency bus service with transit priority and transit-oriented development practices.

Increased demand for transit service could result in significant impacts if transit service is not enhanced to keep pace with demand such as through increased frequency of service within the city. In addition, expanded service hours would necessitate increased transit subsidies, which would likely need to come from local sources.

#### Pedestrian and Bicycle Circulation

The proposed General Plan seeks to promote walking within Corte Madera by improving walking and bicycling conditions, increasing pedestrian and bicyclist safety, and creating a land use context supportive of non-motorized travel.

#### ***Impacts and Mitigation Measures***

**Impact 1: Increased motor vehicle traffic would result in unacceptable level of service (LOS) at study intersections.**

Buildout of the land uses envisioned in the Corte Madera General Plan would result in significant impacts at the following study intersections:

- Tamalpais Drive / Madera Boulevard
- Tamalpais Drive / US 101 SB Off-Ramp
- Tamalpais Drive / US 101 NB Off-Ramp
- Tamalpais Drive / San Clemente Drive
- Madera Boulevard / Council Crest Drive / Tamal Vista Boulevard
- Tamal Vista Boulevard / Fifer Avenue
- Lucky Drive / Fifer Avenue

### Proposed General Plan Policies that Reduce the Impact

The following proposed policies and programs would contribute to reducing this impact to a less than significant level at several study intersections:

- *Implementation Program CIR-1.1a: Town Circulation*

In developing circulation projects, consider all modes of travel, including access to transit stations and stops, and bicycle and pedestrian path connections between work, home, school, and commercial services.

- *Implementation Program CIR-1.1b: Regional Connections*

Partner with local jurisdictions and Marin County to extend bicycle and pedestrian path connections so that circulation is uninterrupted between the Town and adjacent jurisdictions.

- *Implementation Program CIR-1.1c: New Development*

Incorporate convenient bicycle and pedestrian access and facilities in new development projects that link to Town and regional bicycle and pedestrian path connections.

- *Implementation Program CIR-1.2a: Level of Service Standards*

The Town shall strive to maintain Level of Service (LOS) D operation during the weekday morning and evening peak periods at intersections of an arterial street with either another arterial or a collector street and intersections of two collector streets. For projected future conditions the LOS is to be calculated using the average traffic demand over the highest 60-minute period. For all types of controls the Level of Service standard is to be applied to the average operation of the intersection, and not that for any single movement or approach. Exceptions to meeting this standard include:

- 1) Stop-controlled minor street approaches to either collector or arterial streets, where safety shall be the primary consideration;
- 2) Locations where the Town Engineer deems improvement to be technically, financially, or environmentally infeasible;
- 3) Conditions where the improvement would result in significant adverse impacts to other travel modes, including walking, bicycling, or transit; or
- 4) Locations where attainment would ensure the loss of an area's unique character.

- *Implementation Program CIR-1.4a: Interagency Cooperation*

Work with the City of Larkspur, TAM, and Caltrans to explore options for developing an improved connection between the east end of Doherty Drive and Highway 101, as part of the Highway 101/Sir Francis Drake Boulevard Interchange Study. The objective of this connection would be to provide the residents of Larkspur with access to Highway 101 along a route that does not include Tamalpais Drive and Old Corte Madera Square.

- *Implementation Program CIR-1.5a: Circulation Studies*

Developers shall fund and the Town will administer traffic impact studies to address on- and off-site traffic and circulation impacts, including assessments of project level of service intersection impacts.

- *Implementation Program CIR-1.7b: Street Design*

As part of the Design Guidelines, develop streetscape design standards consistent with General Plan design goals and planned Mixed-Use land use designations.

- *Implementation Program CIR-1.7c: Complete Streets*

Develop streetscape design standards that support the concept of complete streets whereby all modes of transportation are accommodated.

- *Implementation Program CIR-1.8a: Regional Transit*

Partner with regional transportation agencies and transit providers to create programs aimed at reducing vehicle miles traveled (VMT) in the Town and region. These programs may include the provision of additional transit options, reviving fixed rail service within the County, carpooling programs, partnerships with employers to support variable work hours, transit passes, and programs aimed at altering travel behavior.

- *Implementation Program CIR-1.8b: Reduce VMT*

Facilitate employment opportunities that minimize the need for automobile trips, such as live/work, telecommuting, satellite work centers, home occupations and mixed use development strategies.

- *Implementation Program CIR-1.12a: Reduction of School Traffic*

Actively support efforts to improve upon and expand transportation options for students and reduce school-related traffic congestion. Examples include supporting increased funding of school buses and crossing guards, construction of safe routes to schools, and staggering school hours.

- *Implementation Program CIR-1.12b: TDM for New Schools*

Work with local school districts in establishing Travel Demand Management (TDM) programs for existing, new or expanded public schools. Private schools shall include TDM proposals with their development applications to the Town.

- *Implementation Program CIR-2.1a: Priority Projects (Tamalpais Drive Interchange)*

Upgrades to the Tamalpais/Paradise Drive – Highway 101 interchange and completion of a Class I bicycle lane along Paradise Drive to the Tiburon City limit (consistent with planned improvements for the Bay Trail) are recognized as top priorities. This priority may also be implemented by construction of a free-standing pedestrian/bicycle bridge to the north or south of the existing interchange.

- *Implementation Program CIR-2.2a: Improvements to Highway 101 (Tamalpais Drive Interchange)*

Work with Caltrans and TAM on plans for improvement of Highway 101 interchanges in the Corte Madera and Larkspur areas. In particular, support those plans that include improvements to the Tamalpais Drive interchange on Highway 101.

- *Implementation Program CIR-2.2b: Tamalpais/Highway 101 Interchange*

The Town designates upgrades to the Tamalpais/Paradise Drive—Highway 101 interchange as its top priority for major roadway improvements. Accordingly, the Town shall work with Caltrans, TAM, and related agencies to ensure the interchange improvements are recognized through regional transportation

construction and funding programs. The improvements to the interchange shall address the following key issues:

- Improvement of existing limited vehicular sight distance on the bridge.
  - Separation of on- and off-ramp traffic from surface street flow.
  - Structural upgrades to the bridge to meet current state and federal standards.
  - Upgrades to the existing pedestrian and bicycle paths and overcrossing, including improved access from intersections adjacent to the overcrossing. (Note: construction of a free-standing pedestrian/bicycle overcrossing north or south of the interchange remains an option.)
  - Improved signal coordination and circulation plans that recognize the five signalized intersections in the immediate vicinity of the interchange on Tamalpais Drive and Paradise Drive/San Clemente Drive, as a means of improving traffic flow and public safety.
  - Expansion of the right-of-way in the vicinity of the interchange, as necessary, to accommodate necessary improvements.
- *Implementation Program CIR-3.1b: Bike Lane Improvements*

The Town will prioritize improvements to existing bicycle lanes and construction of new lanes, based on the following criteria:

- Existing needs that are not adequately addressed.
- The number of potential users served.
- The potential for adverse impacts on surrounding areas.
- The need for supporting improvements.
- Costs for constructing and maintaining improvements.
- Environmental or related impacts associated with construction.

As noted above, the Town's top priorities for construction of bicycle lane improvements are to the Tamalpais/Paradise Drive – Highway 101 interchange, and completion of a Class I facility (constructed in coordination with the Bay Trail) on Paradise Drive south to the Tiburon City limit. Additional priority improvements may include a Class I north/south bicycle lane extending from Town Park to Lucky Drive (achieved in part through paving and possible widening of existing gravel paths), and, as site conditions and right-of-way allow, along Meadowsweet Drive. The Town shall include its prioritization of construction improvements in an updated Bicycle Transportation Plan.

- *Implementation Program CIR-3.1d: Bicycle Paths*

Where appropriate, require proposed development projects adjacent to existing or proposed bikeway routes to include bicycle paths or lanes in their street improvement plans and to construct the bicycle paths or lanes as a condition of project approval.

- *Implementation Program CIR-4.1b: Regional Transit Plans*

Support regional transit, particularly those plans and programs which improve transit services in the Corte Madera area and which may help reduce through-Town traffic, through CIP and other funding efforts and by offering support to such programs, such as Marin County Transit District's Twin Cities Shuttle.

- *Implementation Program CIR-4.1c: Mall Shuttle System*

Work with The Village and Town Center mall operators to reduce shopping traffic and parking congestion by establishing a shuttle system during peak shopping periods for use by local residents. Consider extending the shuttle service to other areas of the community. Alternatively, a pedestrian/bicycle bridge linking the two centers should be explored in conjunction with planned improvements to the Tamalpais/Paradise Drive – Highway 101 interchange. Such a structure could be an attractive and important visual landmark for the community.

Following adoption of the revised LOS criteria called for by the proposed General Plan (Implementation Program CIR-1.2a), LOS D would be considered acceptable at several study intersections. Additionally, side-street stop controlled intersections would be evaluated according to the overall average delay per vehicle and not the delay for a single approach. Based on the Town's updated level of service policy, the LOS for the side-street stop controlled Lucky Drive / Fifer Avenue intersection would change from LOS F to LOS A.

Therefore, impacts would be less than significant at most study intersections, except for the following five intersections that will operate at LOS E or worse:

- Tamalpais Drive / Madera Boulevard (LOS F during the PM peak hour)
- Tamalpais Drive / US 101 SB Off-Ramp (LOS E during the PM peak hour)
- Tamalpais Drive / US 101 NB Off-Ramp (LOS F during the PM peak hour)
- Tamalpais Drive / San Clemente Drive (LOS E during the PM peak hour)
- Madera Boulevard / Council Crest Drive / Tamal Vista Boulevard (LOS F during the PM peak hour)

#### Mitigation Measures

##### *Madera Boulevard / Council Crest Drive / Tamal Vista Boulevard*

The Madera Boulevard/Council Crest Drive/Tamal Vista Boulevard intersection is currently all-way stop controlled. The operations of this intersection can be improved with the installation of a traffic signal or, if right-of-way exists, a roundabout. Traffic signal warrants have been developed by the Federal Highway Administration so that traffic signals will be installed where they will provide a benefit, and not at locations where they will cause undue delay to traffic on the major street or increase collisions. Installation of a signal would reduce impacts at this location to a less than significant level.<sup>7</sup>

##### *Signalized Intersections on Tamalpais Drive*

These intersections include:

- Tamalpais Drive / Madera Boulevard (LOS F during the PM peak hour)
- Tamalpais Drive / US 101 SB Off-Ramp (LOS E during the PM peak hour)

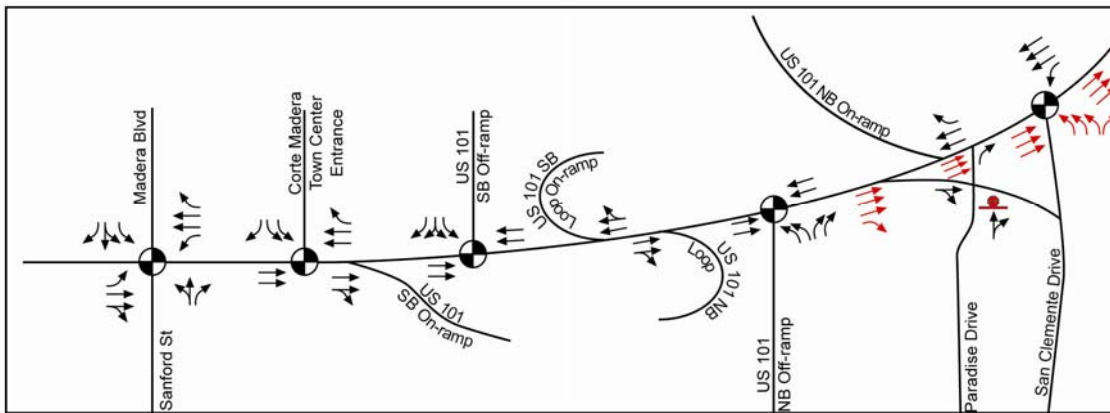
<sup>7</sup> This analysis is intended to examine the general correlation between the planned level of future development and the need to install new traffic signals. It estimates future development-generated traffic compared against a sub-set of the standard traffic signal warrants recommended in the Federal Highway Administration *Manual on Uniform Traffic Control Devices* and associated State guidelines. This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated based on field-measured, rather than forecast, traffic data and a thorough study of traffic and roadway conditions by an experienced engineer. Furthermore, the decision to install a signal should not be based solely upon the warrants, since the installation of signals can lead to certain types of collisions. The responsible state or local agency should undertake regular monitoring of actual traffic conditions and accident data, and timely re-evaluation of the full set of warrants in order to prioritize and program intersections for signalization.

- Tamalpais Drive / US 101 NB Off-Ramp (LOS F during the PM peak hour)
- Tamalpais Drive / San Clemente Drive (LOS E during the PM peak hour)

Fehr & Peers tested the effectiveness of three potential geometric mitigation measures along Tamalpais Drive under Cumulative plus Project Conditions.

Mitigation Measure 1.1 –Tamalpais Drive/San Clemente Ave Improvements

**Figure 5: Lane Configurations with Mitigation Measure 1.1**



In addition to optimizing signal timing along the corridor, the following improvements would improve operations in the Tamalpais Drive interchange area:

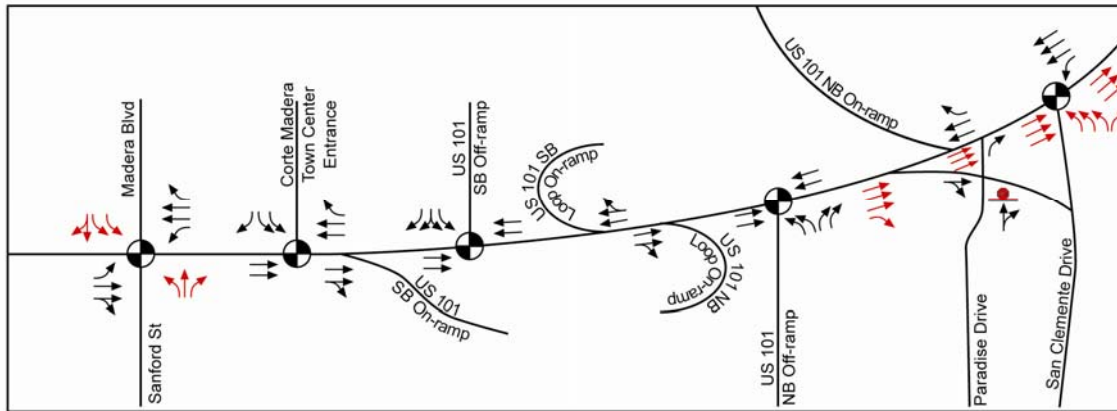
- Widen eastbound Tamalpais Drive to three lanes from the Hwy 101 NB Off-Ramp through the San Clemente Drive intersection
- Extend the third through lane at the San Clemente Drive intersection into one of the northbound left-turn lanes at the Redwood Hwy/Village at Corte Madera South Driveway intersection
- Construct a total of 3 northbound left-turn lanes and one right-turn lane Tamalpais Dr/San Clemente Dr

*Under this mitigation option, Significant and unavoidable impacts would remain at two locations:*

- Tamalpais Drive / Madera Boulevard
- Tamalpais Drive / US-101 Northbound Ramp

Mitigation Measure 1.2 – Tamalpais Drive/Madera Blvd

Figure 6: Lane Configurations with Mitigation Measure 1.2



In addition to the improvements listed above, the following improvements at Tamalpais Dr/Madera Blvd would improve operating conditions at the intersection to LOS D:

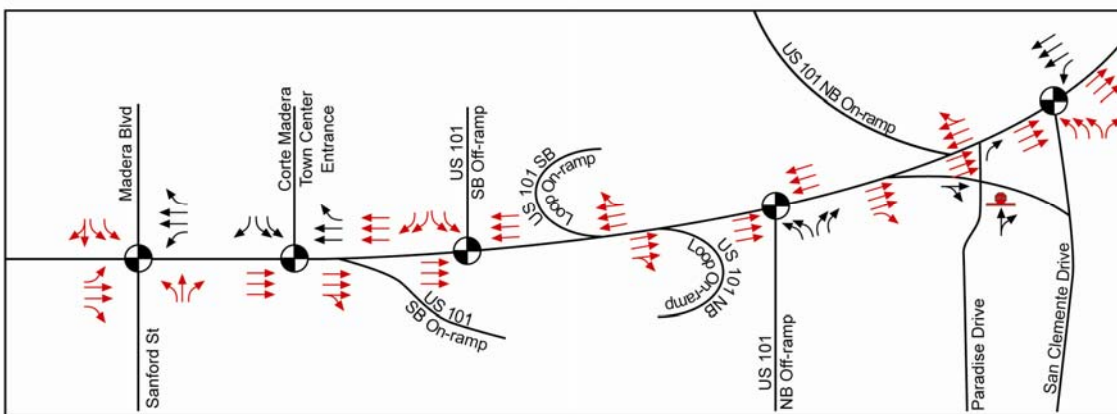
- Re-stripe the northbound direction to one left-turn lane, one through lane, and one right-turn lane
- Re-stripe the southbound direction to double left-turn lanes and a shared through/right-turn lane
- Extend the southbound shared through/right-turn lane to the Mohawk Ave intersection
- Change the signal timing from split phasing to protected left-turns in the northbound and southbound directions

Under this mitigation option, Significant and unavoidable impacts would remain at one location:

- The Tamalpais Dr/US 101 NB Off-Ramp (LOS F).

Mitigation Measure 1.3 – Full Widening of Tamalpais Drive

Figure 7: Lane Configurations with Mitigation Measure 1.3



Expanding Tamalpais Drive to 3-lanes in each direction from the Corte Madera Town Center Entrance to San Clemente Drive, and extending both northbound left-turn pockets at Redwood Highway/Village at Corte Madera

South Driveway to Tamalpais Dr/San Clemente Dr, and the lane configuration changes shown above would improve operating conditions at all study intersections to LOS D or better.

Construction of a bicycle/pedestrian bridge providing access between the Village at Corte Madera and the Corte Madera Town Center would provide an alternate means of access between the two retail centers, decreasing traffic volumes on Tamalpais Drive while preserving the small town character along Tamalpais Drive. The effects of this means of access would require further study.

Under this mitigation option, all impacts would be less than significant but secondary impacts may result if interchange is not reconstructed to effectively and safely accommodate all travel modes.

**Impact 2: Increased motor vehicle traffic would result in unacceptable level of service (LOS) on US-101 (Significant and Unavoidable).**

Implementation of the proposed General Plan would increase the amount of traffic on US-101 in the northbound and southbound directions. In the northbound direction, the volume on two freeway segments would deteriorate to LOS F with growth in regional traffic and implementation of the proposed General Plan. Implementation of the proposed General Plan would also increase the amount of traffic on northbound US-101 by more than one percent of the freeway segment's design capacity.

Proposed General Plan Policies that Reduce the Impact

The following proposed policies and programs would also contribute to reducing this impact (see above for a description of each policy and program):

- *Implementation Program CIR-1.8b: Reduce VMT*
- *Implementation Program CIR-1.8a: Regional Transit*
- *Implementation Program CIR-1.4a: Interagency Cooperation*
- *Implementation Program CIR-2.1a: Priority Projects (Tamalpais Drive Interchange)*
- *Implementation Program CIR-2.2a: Improvements to Highway 101 (Tamalpais Drive Interchange)*
- *Implementation Program CIR-2.2b: Tamalpais/Highway 101 Interchange*

The 2005 Marin Congestion Management Program (CMP) identifies the studied freeway segments as "grandfathered" roadway segments. These roadway segments were operating at a lower LOS than the standard at the time of its implementation in 1991 and are allowed to continue to operate at a lower LOS standard level until such time as they are improved or the traffic load is diverted.

Mitigation Measures

Widening of northbound US-101 to from three to four mixed flow lanes (in addition to one HOV lane) from the Tamalpais Drive to Sir Francis Drake Boulevard interchanges would expand roadway capacity from 7,700 to 9,900 vehicles per hour between Tamalpais Drive and Industrial Way and from 8,800 to 11,000 vehicles per hour north of Industrial Way, thus providing acceptable operations. However, this roadway improvement is neither planned nor funded. Though a number of General Plan policies and programs would help reduce traffic congestion on US-101, they would not reduce this impact to a less-than-significant level. Therefore, this impact is considered significant and unavoidable.

**Impact 3: Implementation of the proposed General Plan could cause increased demand for transit service. (Less than Significant)**

According to the 2000 U.S. Census, 8.7 percent of Corte Madera residents use transit for their journey to work. Based upon the current mode split, it is reasonable to assume that implementation of the proposed General Plan would result in additional residential and non-residential trips and a corresponding increase in demand for transit service. However, the proposed General Plan accommodates a mix of residential densities, commercial uses, and pedestrian and bicycle facilities to promote options for movement beyond the use of motor vehicles and includes proposed enhancements to existing transit service.

No conflicts with current transit provisions or plans are expected as a result of implementation of the proposed General Plan. Therefore, implementation of the proposed General Plan would accommodate its increase in transit demand and would have a less than significant impact.

Proposed General Plan Policies that Reduce the Impact

The following proposed policies and programs would also contribute to reducing this impact (see above for a description of each policy and program):

- *Implementation Program CIR-1.1a: Town Circulation*
- *Implementation Program CIR-1.7b: Street Design*
- *Implementation Program CIR-1.7c: Complete Streets*
- *Implementation Program CIR-1.8a: Regional Transit*
- *Implementation Program CIR-4.1b: Regional Transit Plans*
- *Implementation Program CIR-4.1c: Mall Shuttle System*

Mitigation Measures

None required.

**Impact 4: Provision of secure and safe bicycle parking may be inadequate. (Less than Significant)**

According to the 2000 U.S. Census, 1.1 percent of Corte Madera residents used a bicycle to commute to work. Implementation of the proposed General Plan would result in additional residential and non-residential trips and a corresponding increase in demand for bicycle facilities, including safe and secure bicycle parking.

The project would increase pedestrian and bicycle use in the Town in addition to anticipated growth in pedestrian and bicycle usage in the region. However, the proposed General Plan accommodates a mix of residential densities, commercial uses, and pedestrian and bicycle facilities to promote options for movement other than the use of motor vehicles and includes proposed new bikeways and trails that would connect with existing trails and provide new facilities to accommodate its contribution to this demand. Thus, implementation of the proposed General Plan would accommodate its increase in demand for bicycle infrastructure and would have a less than significant contribution to bicycle infrastructure.

Proposed General Plan Policies that Reduce the Impact

The following proposed policies and programs would also contribute to reducing this impact (see above for a description of each policy and program):

- *Implementation Program CIR-1.1a: Town Circulation*
- *Implementation Program CIR-1.1c: New Development*
- *Implementation Program CIR-1.7c: Complete Streets*
- *Implementation Program CIR-1.7b: Street Design*
- *Implementation Program CIR-3.1b: Bike Lane Improvements*
- *Implementation Program CIR-3.1b: Bicycle Paths*

#### Mitigation Measures

None required.

#### **Impact 5: Implementation of the proposed General Plan could result in increased demand for motor vehicle parking. (Less than Significant)**

Implementation of the proposed General Plan would result in additional residential and non-residential trips and a corresponding increase in demand for motor vehicle parking.

#### Proposed General Plan Policies that Reduce the Impact

Parking policies have the potential to impact the mode choices of residents, employees and retail customers. The Town's development review process implements parking requirements that are intended to ensure that adequate numbers of parking spaces are provided for most land uses.

In addition to the VMT reduction measures identified under Implementation Program CIR-1.8b, which includes programs designed to reduce the demand for vehicle trips and, consequently, parking, the following General Plan policies would reduce the impact on parking demand:

- *Implementation Program CIR-6.1a: Off-Street Parking*  
Through the design review process and appropriate update to the Zoning Ordinance, require all new development to provide sufficient off-street parking. However, the Zoning Ordinance parking standards shall recognize reduced on-site parking requirements when developments include mixed-uses with offset peak hour parking, and provisions for alternative transportation modes.
- *Implementation Program CIR-6.1.b: Preferential Employee Parking*  
The Zoning Ordinance shall require that all new office, commercial and light industrial development that includes 50 or more on-site employees provide preferential employee parking for carpools and vanpools.

With implementation of the trip reduction and parking management policies included in the proposed General Plan, impacts to parking are expected to be less than significant.

#### Mitigation Measures

None required.

## 5. PROJECT ALTERNATIVE CONDITIONS

### PROJECT DESCRIPTION

Two alternatives exist to the original General Plan Project.

- **Alternative 1:** In addition to future development of vacant and underutilized parcels allowed under the Town's existing 1989 General Plan, the Alternative 1 Project scenario includes expansion of the Village at Corte Madera shopping center as well as its development as a mixed use site, adding 185 thousand square feet (ksf) of retail and 300 dwelling units (du). The Village at Corte Madera is located north of Tamalpais Drive to the east of Highway 101 respectively.
- **Alternative 2:** In addition to future development of vacant and underutilized parcels allowed under the Town's existing 1989 General Plan, the Alternative 2 Project scenario is the redevelopment of the northeast corner of the intersection of Tamal Vista Boulevard and Wornum Drive. The Gateway Village Mixed-Use project would include 10 ksf of retail space in addition to 180 dwelling units.
- **Alternative 3:** In addition to future development of vacant and underutilized parcels allowed under the Town's existing 1989 General Plan, the Alternative 3 Project scenario includes both Alternative 1 and Alternative 2 projects.

#### *Project Trip Generation*

Alternative 1 assumes the redevelopment of the Village at Corte Madera as a mixed-use development. Based on this assumption, buildout of the proposed Alternative 1 project would consist of:

- 185 ksf of retail at the Village at Corte Madera
- 300 du at the Village at Corte Madera

The buildout of the proposed Alternative 2 project would consist of:

- 10 ksf of retail at Gateway Village Mixed Use
- 180 du at Gateway Village Mixed Use

The buildout of the proposed Alternative 3 project would consist of:

- 185 ksf of retail at the Village at Corte Madera
- 300 du at the Village at Corte Madera
- 10 ksf of retail at Gateway Village Mixed Use
- 180 du at Gateway Village Mixed Use

Trips generated by existing development and buildout of the proposed General Plan Alternative 1, Alternative 2, and Alternative 3 are shown in Table 9. Trips from buildout of the proposed General Plan Alternative 1, 2, and 3 were estimated based on trip generation equations and rates presented in ITE Trip Generation, 7<sup>th</sup> Edition. The results indicate the net difference in trips between the existing 1989 General Plan and each General Plan Alternative.

**TABLE 9  
NET CHANGE IN VEHICLE TRIPS FOR PROPOSED GENERAL PLAN ALTERNATIVES**

Description <sup>2</sup>	Size <sup>1</sup>	Daily Trips <sup>3</sup>	AM Peak Hour Trips <sup>3</sup>	PM Peak Hour Trips <sup>3</sup>
Alternative 1: Village at Corte Madera Mixed Use	185 ksf & 300 du	5,100	290	480
Alternative 2: Gateway Village Mixed Use	10 ksf & 180 du	1,400	110	130
Alternative 3: Village at Corte Madera Mixed Use/Gateway Village Mixed Use	195 ksf & 480 du	6,500	400	610

Note: Numbers represent the additional trips with buildout of the proposed General Plan Alternatives, compared to buildout of the currently adopted 1989 General Plan

Footnotes:

1. Size of project is measured in thousand square feet and dwelling units.
2. Proposed Alternatives 1, 2, and 3 description based on data provided to Fehr & Peers in May 2007.
3. Trip generation based on ITE Trip Generation equations for Land Use 820 Shopping Center (based on GLA) and Land Use 230 Residential Condominium/Townhouse. The ITE Trip Generation Handbook was used to account for mixed-use internalization.

Source: Fehr & Peers, 2008.

The proposed General Plan Alternative 1, as described above, would generate approximately 290 AM peak hour and 480 PM peak hour trips. The proposed General Plan Alternative 2 would generate 110 AM peak hour trips and 130 PM peak hour trips. General Plan Alternative 3 would generate 400 AM peak hour trips and 610 PM peak hour trips.

### ***Project Trip Distribution and Assignment***

Trip distribution for the net new trips was developed based on existing traffic patterns and the location of nearby residential populations. Inbound and outbound trip distribution for the Project Alternatives are shown on Figures A-5 and A-6 (Appendix A). Cumulative Project Alternative trip assignment is shown on Figures A-7 through A-9 in Appendix A.

### ***Intersection Operating Conditions for Project Alternatives***

Intersection operating conditions for project alternatives are shown in Table 10 on the following page.

**TABLE 10 – INTERSECTION LEVELS OF SERVICE FOR PROJECT ALTERNATIVES**

Intersection <sup>1, 2</sup>	Cumulative No Project		Project (Proposed General Plan)		Alternative 1		Alternative 2		Alternative 3	
	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1. Tamalpais Drive / Madera Boulevard	35	C	>80	F	39	D	38	D	36	D
2. Tamalpais Drive / Corte Madera Town Center Entrance	10	A	17	B	10	A	9	A	10	A
3. Tamalpais Drive / US 101 SB Off-Ramp	22	C	74	E	15	B	12	B	17	B
4. Tamalpais Drive / US 101 NB Off-Ramp	29	C	>80	F	73	E	27	C	67	E
5. Tamalpais Drive / San Clemente Drive	26	C	57	E	60	E	25	C	63	E
6. Redwood Highway / Village at Corte Madera South Driveway	11	B	17	B	27	C	11	B	23	C
7. Redwood Highway / Village at Corte Madera Middle Driveway	5	A	7	A	8	A	5	A	14	B
8. Redwood Highway / Village at Corte Madera Northeast Driveway	8	A	9	A	8	A	7	A	8	A
9. Tamalpais Drive / Eastman Avenue	9	A	9	A	9	A	9	A	9	A
10. Madera Boulevard / Council Crest Drive / Tamal Vista Boulevard	>50	F	>50	F	>50	F	>50	F	>50	F
11. Redwood Highway / Wornum Drive	14	B	16	B	15	B	14	B	15	B
12. Tamal Vista Boulevard / Wornum Drive	15	B	17	B	16	B	16	B	17	B
13. Tamal Vista Boulevard / Fifer Avenue	40	D	43	D	43	D	43	D	47	D
14. Lucky Drive / Fifer Avenue <sup>3</sup>	27 (2)	D (A)	28 (3)	D (A)	28 (2)	D (A)	28 (2)	D (A)	29 (2)	D (A)
15. Redwood Hwy / Industrial Way	17	B	18	B	17	B	17	B	17	B
16. Corte Madera Avenue / Redwood Avenue	30	C	31	C	31	C	30	C	31	C
17. Paradise Drive / San Clemente Drive	11	B	10	B	10	B	11	B	10	B
18. Paradise Drive / Harbor Avenue	12	B	12	B	12	B	12	B	12	B
19. Paradise Drive / El Camino Drive / Seawolf Passage	15	B	15	B	15	B	15	B	15	B

Notes:

<sup>1</sup> Results from intersections 1-8 along the Tamalpais Drive corridor are based on microsimulation analysis.

<sup>2</sup> All intersections are signalized except #14 Fifer/Lucky, which is SSSC, and #10 Council Crest & Madera/Tamal Vista, which is AWSC.

<sup>3</sup> Delay is report for worst approach in accordance with the Highway Capacity Manual. Average delay is for this intersection (i.e. all approaches) is reported in parentheses.

Source: Fehr & Peers, September 2008

### ***Discussion of Alternatives***

The “no project” alternative and the three “project” alternatives would reduce impacts at several intersections. Table 11 below presents the impacts with the three project alternatives.

Under Alternative 1, intersection would be considered less than significant with implementation of the “Option 1” mitigation measures (excluding a third northbound left-turn lane on San Clemente Drive at Tamalpais Drive) described on Page 31 and adoption of the policies and actions contained in the proposed General Plan.

Under Alternatives 1, 2, and 3, impacts to northbound US-101 are considered significant and unavoidable.

**TABLE 11 - SUMMARY OF INTERSECTION AND FREEWAY TRAFFIC IMPACTS**

Impact Location	Description of Impact	Potential Mitigation Measure	Project Alternatives		
			Alternative 1	Alternative 2	Alternative 3
<b>Tamal Vista Boulevard / Madera Boulevard / Council Crest</b>	Cumulative PM peak hour intersection operations are LOS F	Signalize intersection (or install roundabout)	Same impact and mitigation as proposed project	Same impact and mitigation as proposed project	Same impact and mitigation as proposed project
<b>Tamal Vista Boulevard / Fifer Avenue</b>	Cumulative PM peak hour intersection operations are LOS D	Optimize signal timing, Adopt policies and actions contained in proposed General Plan	Same impact and mitigation as proposed project	Same impact and mitigation as proposed project	Same impact and mitigation as proposed project
<i>Tamalpais Drive Interchange Area</i>					
<b>Tamalpais Drive / Madera Boulevard</b>	Cumulative PM peak hour intersection operations are LOS F	Option 1: Construct improvements to Tamalpais Drive / San Clemente Drive intersection; Adopt policies and actions contained in proposed General Plan <i>- Under this mitigation option, Significant and unavoidable impacts remain at two locations (Tamalpais Drive / Madera Boulevard and Tamalpais Drive / US-101 Northbound Ramp)</i>	Cumulative PM peak hour intersection operations are LOS D. Adoption of policies and actions contained in proposed General Plan would reduce impact to a less than significant level	Adoption of policies and actions contained in proposed General Plan would reduce impact to a less than significant level	Adoption of policies and actions contained in proposed General Plan would reduce impact to a less than significant level
<b>Tamalpais Drive / US-101 Southbound Off-Ramp</b>	Cumulative PM peak hour intersection operations are LOS E		Impacts less than significant	Impacts less than significant	Impacts less than significant
<b>Tamalpais Drive / US-101 Northbound Off-Ramp</b>	Cumulative PM peak hour intersection operations are LOS F	Option 2: Construct improvements to Tamalpais Drive / San Clemente Drive intersection; Construct Improvements to Tamalpais Drive / Madera Boulevard intersection; Adopt policies and actions contained in proposed General Plan <i>- Under this mitigation option, Significant and unavoidable impacts remain at one location (Tamalpais Drive / US-101 Northbound Ramp)</i>	Cumulative PM peak hour intersection operations are LOS E. Construction of "Option 1" improvements and adoption of policies and actions contained in proposed General Plan would reduce impact to a less than significant level (LOS C)	Impacts less than significant	Cumulative PM peak hour intersection operations are LOS E. Construction of "Option 1" improvements and adoption of policies and actions contained in proposed General Plan would reduce impact to a less than significant level (LOS C)
<b>Tamalpais Drive / San Clemente Drive</b>	Cumulative PM peak hour intersection operations are LOS E	Option 3: Reconstruct Tamalpais interchange to Provide three through lanes in each direction; Adopt policies and actions contained in proposed General Plan <i>- Under this mitigation option, all impacts would be less than significant.</i>	Cumulative PM peak hour intersection operations are LOS E. Construction of "Option 1" improvements would and adoption of policies and actions contained in proposed General Plan would reduce impact to a less than significant level (LOS C)	Impacts less than significant	Cumulative PM peak hour intersection operations are LOS E. Construction of "Option 1" improvements would and adoption of policies and actions contained in proposed General Plan would reduce impact to a less than significant level (LOS C)
<b>Northbound US-101 mainline</b>	Cumulative PM peak hour operations are LOS F	Significant and Unavoidable, though northbound US-101 freeway segments are "grandfathered" based on the 2005 Marin County Congestion Management Program	Significant and Unavoidable	Significant and Unavoidable	Significant and Unavoidable

Source: Fehr & Peers, August 2008