Planning Commission Meeting

PLN 2014-00430

Case

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Attachment

CONNECT THE COASTSIDE
Buildout Analysis and Traffic Projections Final Report

For the
County of San Mateo
Planning and Building Department

Prepared By:

35 years DKS Celebrating

November 20, 2014

CONNECT THE COASTSIDE

Buildout Analysis and Traffic Projections Final Report

Prepared for
San Mateo County

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November 20, 2014

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INTRODUCTION

In 2012, the California Coastal Commission certified a package of amendments known as the Midcoast Update to San Mateo County's Local Coastal Program (LCP). Section 2.53 of the Updated LCP requires San Mateo County to prepare a Comprehensive Transportation Management Plan (CTMP). ***Connect the Coastside*** is the project that will produce the CTMP. The CTMP requirement of the California Coastal Commission responds to the impact that growth in the region has had on roadway capacity, which is viewed by many as insufficient to support the current or future needs of the community and visitors.

The purpose of ***Connect the Coastside*** is to document the source and extent of the transportation problems of the Midcoast and Half Moon Bay and to identify ways to balance development and transportation mobility and access. The CTMP produced in ***Connect the Coastside*** will determine how to minimize and mitigate current and future traffic along Highway 1, State Route 92, and other arterial roads on the Midcoast and in the City of Half Moon Bay. ***Connect the Coastside*** will address the cumulative traffic impacts of future residential development, including single, multi-family, and second unit residential development and non-residential development. The project will identify and thoroughly evaluate the feasibility of measures to minimize and mitigate these impacts, including the possibility of developing an in-lieu fee traffic mitigation program, expanding public transit (including buses and shuttles), and/or growth-management actions that will regulate buildout potential based on the adequacy of the transportation system to absorb the growth within acceptable levels.

The approach to the initial work in this project has been to identify significant gaps in the existing transportation infrastructure and services and address them in a way that will lead to successful implementation of a CTMP for the area. Excellent technical work has already been done for the area and recent forums have given residents, businesses and other stakeholders numerous opportunities to express concerns about the existing and future transportation needs of the area and their hopes for future projects. The primary goal of this project is to help the community leaders and decision makers reach a consensus on what transportation improvements are needed and can be implemented and how the improvements will be funded and financed. Because of the inter-jurisdictional nature of this project and varying desires of the residents, businesses and other stakeholders, the DKS Team and San Mateo County will use a well-structured process of community engagement and input supported by strong technical skills to build a consensus on the CTMP.

ANALYSIS OF EXISTING CONDITIONS

To establish a baseline for analysis in the CTMP, the DKS Team collected extensive data on the existing conditions and levels of service offered by the transportation facilities and services in the Midcoast and Half Moon Bay. Some of the data on existing conditions came from recently completed transportation planning projects in the Study Area, but large amounts of new data were also collected. Through the work in this task, the DKS Team was able to produce a description of the existing conditions and levels of service provided for the roadway system (Highway 1 and State Route 92), parking facilities serving the beaches and other parks along the coastside, as well as pedestrian and bicycle facilities and transit service.

BUILDOUT ANALYSIS AND DEVELOPMENT OF TRAVEL FORECASTS

An important step in development of the CTMP was to evaluate the existing and future development potential of the Study Area by conducting a buildout analysis and an assessment of the current and future transportation deficiencies. The DKS Team collected and analyzed prior buildout projections for the Midcoast and Half Moon Bay based on the current adopted plans for each area. Using an inventory of vacant and underutilized parcels, and building on the DKS Team's analysis for the Princeton and Half Moon Bay planning areas, a maximum buildout under current zoning in the unincorporated Midcoast and the City of Half Moon Bay was produced.

Based on the updated buildout analysis, the DKS Team prepared traffic forecasts for a 25-year buildout horizon using the most up-to-date county-wide C/CAG model. The traffic forecasts used recent traffic counts to tie forecasts to existing traffic volumes. The updated travel forecasts were then used to estimate future volumes for all roadway segments in the Midcoast and Half Moon Bay. With the updated future forecast, link and intersection level of service analysis were conducted for the buildout year.

IDENTIFICATION OF GAPS AND DEFICIENCIES

To evaluate the adequacy of the transportation facilities and services in the study, under current conditions and for the 25-year forecasts, DKS has assembled a list of the transportation service standards that already exist for the area. This list was drawn from the San Mateo County Congestion Management Program, the City of Half Moon Bay Circulation Element, the San Mateo County General Plan and the Local Coastal Program for the Midcoast. The DKS Team has also used the Community Engagement process of the project to explore public and stakeholder support for possible additional service standards by which to judge existing and future transportation gaps and deficiencies.

With the list of existing and potential new standards, the DKS Team has evaluated the sufficiency of the existing and planned future transportation system for meeting the travel needs of the Midcoast and Half Moon Bay under the buildout land use forecast. The deficiencies and gaps identified in this report will be used to develop alternatives in the next major phase of the project. In the next phase, the DKS Team will use input from the Community Engagement phase as well as its own prior work and professional experience to formulate multi-modal alternatives for addressing the gaps and deficiencies identified in the previous task. Much of the focus will be on roadway deficiencies as reflected in segment and intersection level of service calculations, but alternative elements for all modes of travel will be developed including transit, bicycling and walking.

EXISTING CONDITIONS AND TRANSPORTATION LEVEL OF SERVICE

EXISTING TRANSPORTATION CONDITIONS AND STANDARDS

Traffic

The roadway network for the Study Area is rooted in the north-south connectivity provided by Cabrillo Highway (Highway 1), and the east-west connectivity provided by San Mateo Road (SR 92). Both backbone roadways are Caltrans-controlled. Highway 1 and SR 92 provide regional connections to San Francisco (north), San Mateo (east) and Santa Cruz (south). The Caltrans facilities are constructed as arterial roadways, and continue to be managed by Caltrans.

In addition to normal commuter and local traffic patterns, the study area is a regional coastal destination as well as a seasonal destination due to annual events including the Half Moon Bay Pumpkin Festival, Pacific Coast Dream Machines, and Mavericks. As a result, there is a large amount of traffic demand generated independent of local land use.

The roadway network serves to connect land uses and facilitates movement of persons and goods to and from, within, and through the region. The hierarchy of roadways identifies roadways to accommodate traffic and goods movement at higher speeds and roadways serving neighborhoods with smaller cross-sections and lower speeds.

Roadway Classification

A functional classification system provides the framework for the design and operation of the roadway system. While the San Mateo County General Plan and Local Coastal Program do not define a classification system, the City of Half Moon Bay includes the following classification and existing roadway designations for roads within Half Moon Bay:

Limited Access - Limited or controlled access highways serve inter-urban, statewide, and interstate travel. Planning of these facilities rests largely with agencies other than the City. Highway 1 and SR 92 are limited access roads in Half Moon Bay. Both are also designated as Truck Routes throughout the City. Past City policy directed that access to existing and future development in Half Moon Bay be consolidated at designated signalized locations when possible.

Arterial - Arterial streets primarily serve intra-city travel, carrying traffic from collector streets to and from other parts of the city. Access to abutting property is subordinate to the primary function of moving traffic between residential neighborhoods and the downtown and commercial areas. Planning practice has been to minimize the number of direct access driveways on arterial streets. Main Street and Kelly Avenue are classified as Arterials within Half Moon Bay. The portion

of Main Street north of SR 92 is also designated a Truck Route because of the importance of deliveries to the business in the downtown and south of the downtown.

Collector - Collector streets directly or indirectly link local streets with arterials and are designed to primarily serve residential and recreational traffic. This traffic may include trips between adjacent neighborhoods, but collectors are not intended to handle cross-town traffic. Stone Pine Road, Purissima Street, Frontage Road, Fairway Drive, and Miramontes Point Road are classified as Collector streets. Typical design standards for new residential collector streets provide for two lanes (one travel lane in each direction) with parking allowed on both sides of the street and sidewalks on both sides of the street in a total right-of-way width of 60 feet.

Local Access - Local Access streets are intended to provide direct access to abutting land uses. Existing roads in Half Moon Bay not designated as Collector, Arterial or Limited Access will be classified as Local Access streets based on their current design and usage. Future roads, not included in one of the above categories, will be planned as Local Streets. Typical design standards for new Local Access streets are similar to Collector streets with respect to travel lanes, parking, and sidewalks; however, due to anticipated lower traffic volumes and speeds, they can be narrower and have a total right-of-way width of 50 feet.

Intersection Level of Service

Vehicle circulation concerns primarily relate to times of peak roadway use: the commute period and weekend recreational use, especially those with significant traffic for events. Estimates of level of service (LOS) for key intersections along Highway 1 and SR 92 are provided in Table 2 for the Weekday AM peak period (7AM-9AM) and PM peak period (4PM-6PM) and the Weekend Midday recreational peak period (10AM-12PM) conditions based on counts taken in 2012 and 2014.

LOS analysis was conducted using the criteria described in the City/County Association of Governments (C/CAG) 2011 Congestion Management Program. LOS as defined in the Highway Capacity Manual (HCM) is a quality measure describing operating conditions within a traffic stream. It is generally described in such service measures terms as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. The LOS evaluation indicates the degree of congestion that occurs during peak travel periods and is the principal measure of roadway and intersection performance. LOS can range from "A" representing free-flow conditions, to "F" representing extremely long delays. LOS D is typically considered acceptable for a peak hour in urban areas. LOS E is approaching capacity and LOS F represents conditions at or above capacity. LOS definitions, considering vehicle delay for signalized and unsignalized intersections, are shown in Table 1.

Table 1: Level of Service Thresholds and Definitions

Level of Service	Average Control Delay (seconds/vehicle)		Description
	Signalized Intersections	**Unsignalized Intersections**	
A	≤ 10	≤ 10	Free flow/ Insignificant Delay
B	> 10 and ≤ 20	> 10 and ≤ 15	Stable Operation/ Minimal Delay
C	> 20 and ≤ 35	> 15 and ≤ 25	Stable Operation/ Acceptable Delay
D	> 35 and ≤ 55	> 25 and ≤ 35	Approaching Unstable/ Tolerable Delay
E	> 55 and ≤ 80	> 35 and ≤ 50	Unstable Operation/ Significant Delay
F	> 80	> 50	Forced Flow/ Excessive Delay

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

Notes: Worst Approach Delay (in seconds per vehicle) for Unsignalized Intersections

Level of Service standards

Level of Service (LOS) standards relevant to the Study Area are provided by four documents:

- *Local Coastal Program* (LCP)[1]
- *Half Moon Bay Circulation Element*[2]
- *Congestion Management Program* (CMP)[3]
- *San Mateo County Traffic Impact Study Requirements*[4]

The policy defined by the LCP in assessing the need for road expansion has LOS D as the desired level of service for segments during commuter peak periods, except during recreation peak periods when LOS E is acceptable. The LCP has an intersection standard of LOS D. The standards

[1] County of San Mateo Local Coastal Program Policies, 2013, County of San Mateo, Planning and Building Department
[2] Half Moon Bay Circulation Element, 2013, City of Half Moon Bay
[3] San Mateo County Congestion Management Program, 2011, San Mateo City/County Association of Governments (C/CAG)
[4] San Mateo County Traffic Impact Study Requirements, 2013, County of San Mateo, Department of Public Works, Roadway Services

set in the LCP will be used as the standards for intersections within unincorporated areas included in this study and for roadway segments for the entire study area.

The City of Half Moon Bay has a standard of LOS C for intersections along Highway 1 and SR 92, except during the peak two-hour commuting period on weekdays and the ten-day peak recreational hour[5] on weekends when LOS E is acceptable. No standards are defined for intersections not along Highway 1 and SR 92. No differentiation is made between signalized and unsignalized intersections. The standards set by the City of Half Moon Bay will be used as the standards for intersections within Half Moon included in the this study.

The CMP provides LOS standards for peak commuting hours for roadways and intersections designated to be in the CMP Roadway System. LOS standards were selected during the development of the 1991 Congestion Management Program and based on 1991 existing conditions and projected 2000 conditions. The standards are based on Volume/Capacity (v/c) ratio, though it is recognized that HCM2000 and HCM2010 are considered regionally consistent for LOS analysis. C/CAG currently uses the HCM1994 for calculating roadway LOS and HCM2000 for intersection LOS. There is no discussion of LOS standards for peak recreational period. Roadway segments along Highway 1 and SR 92 within the Study Area have a LOS standard of 'E'. The intersections of Highway 1/SR 92 and Main Street/SR 92 are the only CMP intersections within the Study Area. The Highway 1 and SR 92 intersection has a CMP LOS standard of 'E' and the intersection of Main Street and SR 92 has a CMP LOS standard of 'F'. As the standards set in the LCP and Half Moon Bay Circulation Element are stricter than those stated by the CMP, they will take precedence to the standards given in the CMP.

The *San Mateo County Traffic Impact Study Requirements* defines the intersection LOS standard for San Mateo County as LOS C with no individual movement operating at worse than LOS D. There is no definition of peak periods, however it is noted that a standard of LOS D during a peak period may be allowed for dense urban conditions per County's discretion. No differentiation is made between signalized and unsignalized intersections besides the LOS standard defined for individual movements. While the standards defined by the *San Mateo County Traffic Impact Study Requirements* are stricter than the other standards defined for the study area, they are not clearly defined for peak periods and so the standards set forth in the LCP specifically for the coastal study area will take precedence.

Existing Intersection Level of Service

Existing Condition intersection LOS was calculated for 48 key intersections located within the Study Area using HCM 2000 methodology and Synchro 8.0 software. Figure 1 shows the location of the study intersections within the Study Area. The majority of the Study intersections are located along Highway 1 and SR 92, however the intersection of Obispo Road and Coronado Street in El Granada and intersections along Main Street within the City of Half Moon Bay were also included in the analysis. Delay and LOS are provided for Weekday AM and PM peak hour and Weekend peak recreational hour in Table 2. The LOS standard for each intersection is also provided.

[5] For the purpose of this report, the ten-day peak recreational hour is referred to as the Midday peak hour

Existing Roadway Level of Service

Existing Condition LOS was calculated for 47 roadway segments located along Highway 1 and SR 92 within the Study Area as shown in Figure 1. Demand, capacity and LOS are provided for Weekday AM and PM peak hour and Weekend peak recreational hour.

Traffic Collisions

Between the years of 2005 and 2011 there have been a total of 570 collisions along Highway 1 and SR 92 within the study area, including 306 crashes along Highway 1 and 264 crashes along SR 92. These included 50 severe injuries and 8 fatalities.

Of the collisions, 80 occurred within unincorporated Midcoast region of San Mateo County along Highway 1, 226 occurred within the City of Half Moon Bay, and 222 occurred within the unincorporated region of San Mateo County along SR 92 and east of the City of Half Moon Bay.

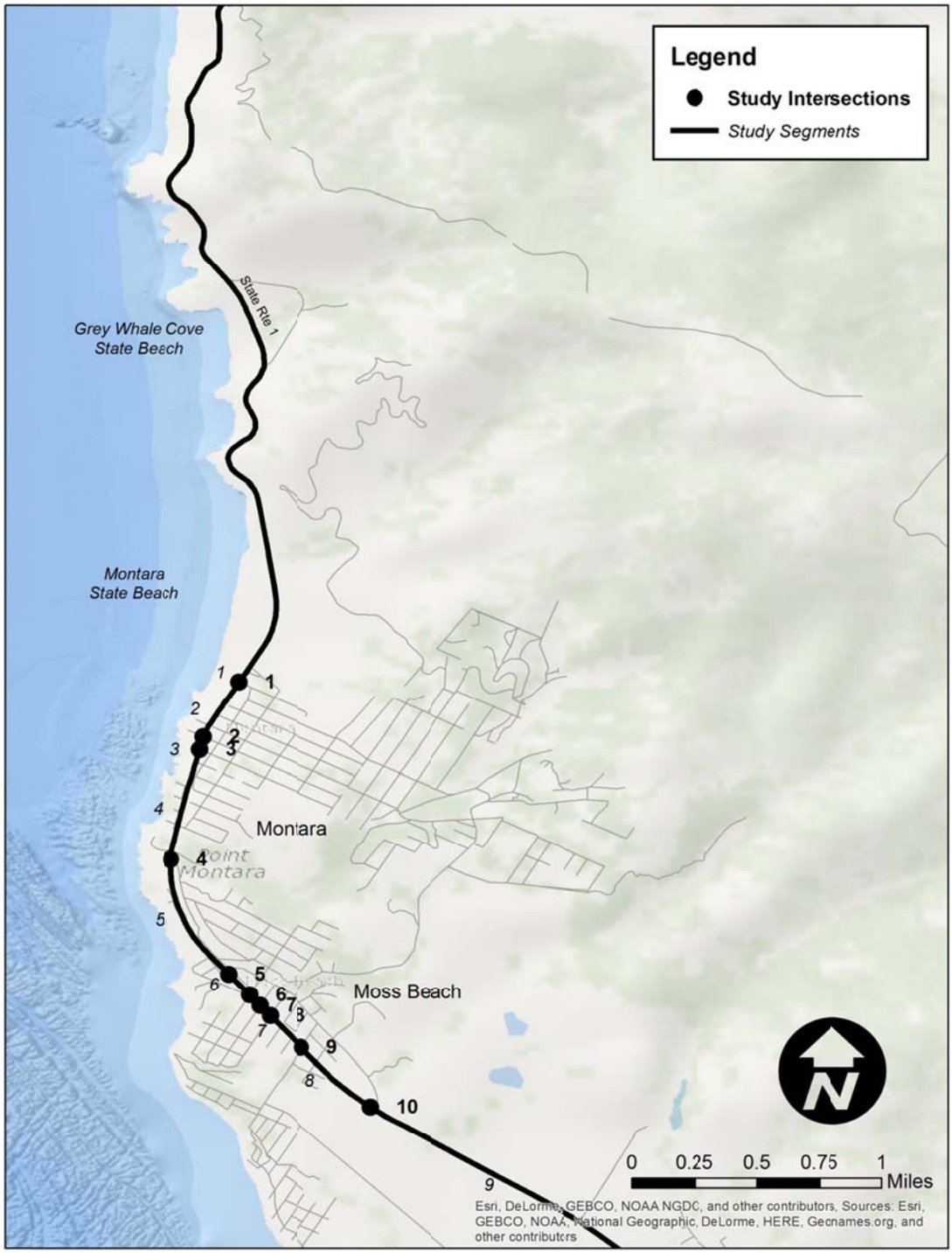


Figure 1a: Study Intersections and Roadway Segments

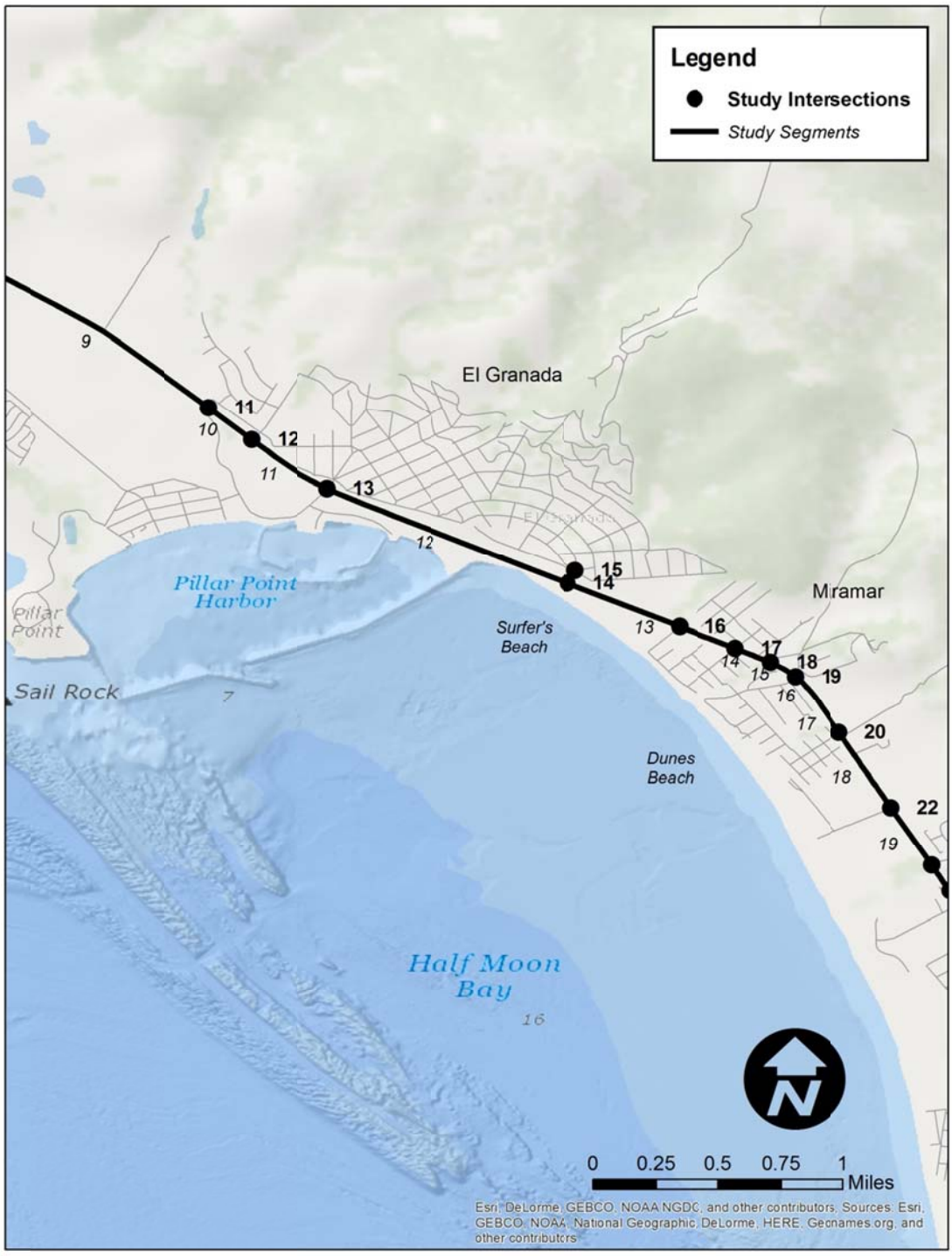


Figure 1b: Study Intersections and Roadway Segments

Figure 1c: Study Intersections and Roadway Segments

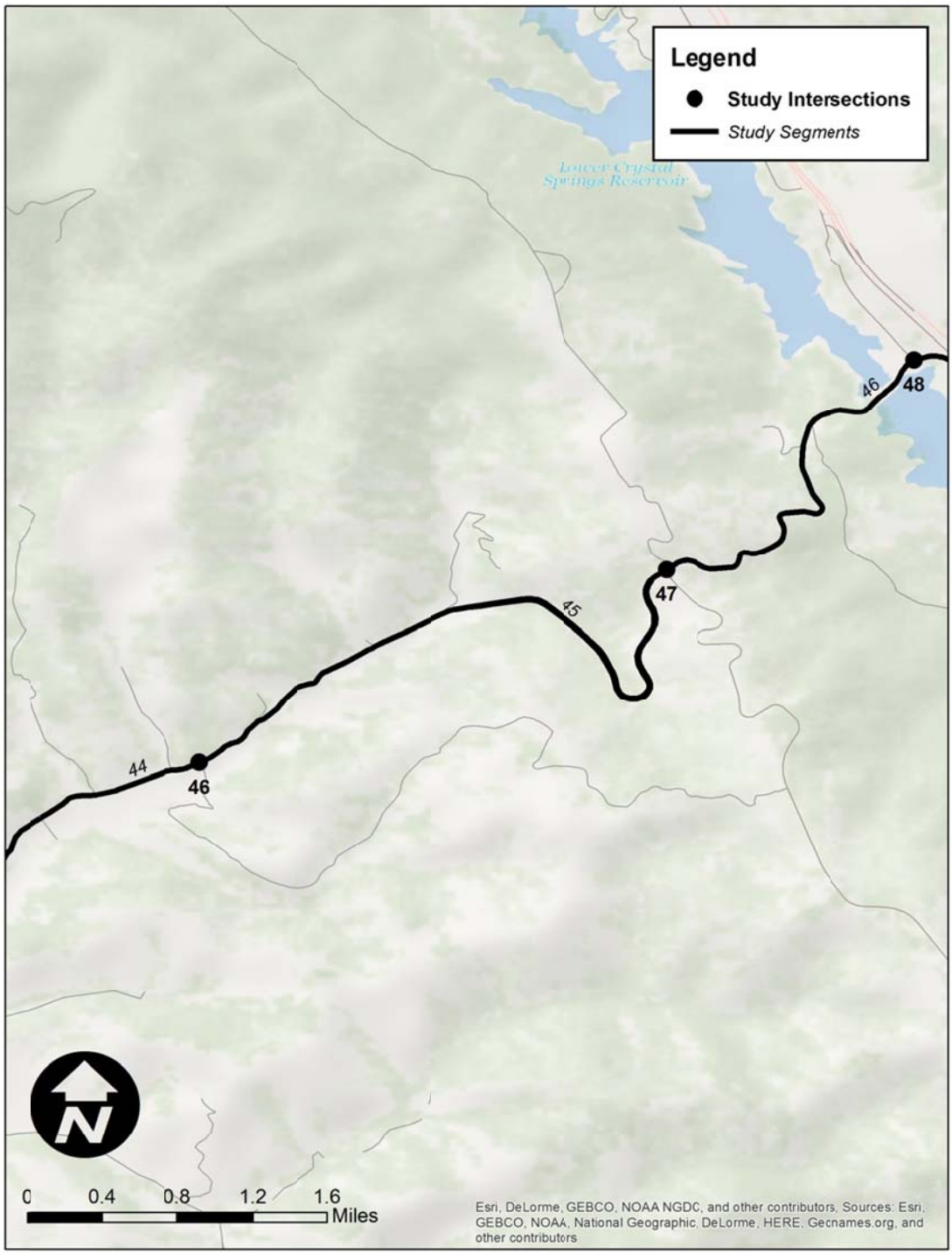


Figure 1d: Study Intersections and Roadway Segments

Table 2: Existing Conditions Peak Hour Intersection Level of Service

Intersection Number	LOS Standard[1]	Street Names	Control Type	AM Peak Hour		PM Peak Hour		Midday Peak Hour	
				Delay[2]	LOS	Delay[2]	LOS	Delay[2]	LOS
1	C(D)	SR-1 / 2nd St	TWSC	16.1 (WB)	C	15.7 (WB)	C	22.4 (WB)	C
2	C(D)	SR-1 / 7th St	TWSC	12.6 (EB)	B	13.0 (EB)	B	14.8 (EB)	B
3	C(D)	SR-1 / 8th St	TWSC	18.7 (WB)	C	32.5 (WB)	D	**45.3 (WB)**	**E**
4	C(D)	SR -1 / Carlos St	TWSC	12.3 (WB)	B	12.1 (WB)	B	12.7 (WB)	B
5	C(D)	SR-1 / Vallemar St	TWSC	17.6 (EB)	C	24.5 (WB)	C	21.8 (WB)	C
6	C(D)	SR-1 / California Ave	TWSC	25.6 (WB)	D	**44.4 (WB)**	**E**	**>50 (WB)**	**F**
7	C(D)	SR-1 / Virginia Ave	TWSC	22.6 (WB)	C	**38.5 (WB)**	**E**	**>50 (WB)**	**F**
8	C(D)	SR-1 / Vermont Ave (WB)	TWSC	27.5 (WB)	D	**45.0 (WB)**	**E**	**>50 (EB)**	**F**
9	C(D)	SR-1 / Cypress Ave (EB)	TWSC	**44.2 (EB)**	**E**	**>50 (WB)**	**F**	**>50 (EB)**	**F**
10	C(D)	SR-1 / St Etheldore St	TWSC	23.2 (WB)	C	34.1 (WB)	D	**37.1 (WB)**	**E**
11	C(D)	SR-1 / Capistrano Rd (North)	TWSC	17.4 (EB)	C	22.1 (EB)	C	30.6 (EB)	D
12	C(D)	SR-1 / Coral Reef Ave	TWSC	16.3 (WB)	C	24.5 (WB)	C	28.7 (WB)	D
13	C(D)	SR-1 / Capistrano Rd (South)	Signalized	19.1	B	17.5	B	20.7	C
14	C(D)	SR-1 / Coronado St	Signalized	21.7	C	14.4	B	11.4	B
15	C(D)	Obispo Rd / Coronado St	TWSC	12.9 (EB)	B	10.2 (WB)	B	12.3 (WB)	B
16	C(D)	SR-1 / Magellan Ave	TWSC	**>50 (EB)**	**F**	**>50 (EB)**	**F**	**>50 (EB)**	**F**
17	C(D)	SR-1 / Medio Ave	TWSC	**>50 (WB)**	**F**	**>50 (WB)**	**F**	**>50 (WB)**	**F**

Intersection Number	LOS Standard[1]	Street Names	Control Type	AM Peak Hour		PM Peak Hour		Midday Peak Hour	
				Delay[2]	LOS	Delay[2]	LOS	Delay[2]	LOS
18	C(D)	SR-1 / Miramar Dr	TWSC	21.3 (EB)	C	**>50 (EB)**	**F**	46.9 (EB)	E
19	E	SR-1 / Mirada Rd	TWSC	**>50 (WB)**	**F**	**>50 (WB)**	**F**	**>50 (WB)**	**F**
20	E	SR-1 / Roosevelt Blvd	TWSC	47.2 (EB)	E	34.9 (EB)	D	**>50 (EB)**	**F**
22	E	SR-1 / Young Ave	TWSC	**>50 (WB)**	**F**	47.1 (WB)	E	**>50 (WB)**	**F**
23	E	SR-1 / Ruisseau Francais	Signalized	3.8	A	6.2	A	23.8	C
24	E	SR-1 / Frenchmans Creek Rd	TWSC	**>50 (WB)**	**F**	**>50 (WB)**	**F**	**>50 (WB)**	**F**
25	E	SR-1 / Venice Blvd	TWSC	**>50 (EB)**	**F**	**>50 (EB)**	**F**	**>50 (EB)**	**F**
26	E	SR-1 / Spindrift Wy	TWSC	**>50 (WB)**	**F**	**>50 (WB)**	**F**	**>50 (WB)**	**F**
27	E	SR-1 / Kehoe Ave	TWSC	41.3 (EB)	E	38.4 (EB)	E	**>50 (EB)**	**F**
28	E	SR-1 / Grandview Blvd	TWSC	**>50 (WB)**	**F**	**>50 (WB)**	**F**	**>50 (WB)**	**F**
29	E	SR-1 / Terrace Ave	TWSC	**>50 (WB)**	**F**	**>50 (WB)**	**F**	**>50 (WB)**	**F**
30	E	SR-1 / Grand Blvd	TWSC	46 (EB)	E	33.4 (EB)	D	38.5 (EB)	E
31	E	SR-1 / Belleville Blvd	TWSC	34.7 (EB)	D	31.3 (EB)	D	14.6 (EB)	B
32	E	SR-1 / N. Main St	Signalized	39.8	D	**>80**	**F**	37.8	D
33	E	SR-1 / SR-92	Signalized	22.4	C	28.2	C	56.8	E
34	E	SR-1 / Kelly Ave	Signalized	43.4	D	41.6	D	39.5	D
35	E	SR-1 / Filbert St	TWSC	**>50 (EB)**	**F**	**>50 (EB)**	**F**	**>50 (EB)**	**F**
36	E	SR-1 / Poplar St	Signalized	18.0	B	9.6	A	31.1	C
37	E	SR-1 / Seymour St	TWSC	27 (EB)	D	20.8 (EB)	C	**>50 (EB)**	**F**

Intersection Number	LOS Standard[1]	Street Names	Control Type	AM Peak Hour		PM Peak Hour		Midday Peak Hour	
				Delay[2]	LOS	Delay[2]	LOS	Delay[2]	LOS
38	E	SR-1 / Higgins Canyon Rd/Main St	TWSC	22.1 (WB)	C	23.5 (WB)	C	41.3 (WB)	E
39	E	SR-1 / Fairway Dr	Signalized	7.7	A	5.9	A	15.1	B
40	E	SR-1 / Miramontes Point Rd	Signalized	14.3	B	14.6	B	26.0	C
41	D	Main St / Lewis Foster Dr	TWSC	13.8 (WB)	B	24.6 (WB)	C	21.2 (WB)	C
42	E	Main St / SR-92	Signalized	30.5	C	26.0	C	**>80**	**F**
43	D	Main St / Kelly St	AWSC	8.2	A	9.8	A	10.4	B
44	D	Main St / Poplar St	TWSC	13 (EB)	B	11.8 (EB)	B	10.7 (EB)	B
45	D	Main St / Seymour St	AWSC	8.0	A	8.1	A	7.8	A
46	C(D)	SR-92 / Muddy Rd	TWSC	**>50 (SB)**	**F**	**>50 (SB)**	**F**	33.5 (SB)	D
47	C(D)	SR-92 / Skyline Blvd (West)	TWSC	**35.5 (NB)**	**E**	**>50 (NB)**	**F**	**>50 (NB)**	**F**
48	C(D)	SR-92 / SR-35 (East)	Signalized	11.7	B	22.0	C	41.9	D

[1] Standards provided within parenthesis are for individual movements.

[2] Signalized intersections and all-way stop controlled (AWSC) intersections are reported by the average delay and LOS for the intersection; two-way stop controlled (TWSC) intersections are reported with the worst approach's delay and LOS. **Bolded** intersections fall below the defined LOS standard.

Table 3: Existing Conditions Peak Hour Roadway Segment Level of Service

Roadway Segment Number	Class	Location	Capacity	Existing Condition								
				AM			PM			Sat Midday		
				Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]
1	Two-Lane Highway	SR-1 between 1st St and 2nd St	2800	963	0.34	D	1401	0.50	D	1426	0.51	D
2	Two-Lane Highway	SR-1 between 2nd St and 7th St	2800	965	0.34	D	1357	0.48	D	1395	0.50	D
3	Two-Lane Highway	SR-1 between 7th St and 9th St	2800	930	0.33	D	1227	0.44	D	1424	0.51	D
4	Two-Lane Highway	SR-1 between 9th St and Carlos St	2800	893	0.32	C	1237	0.44	D	1512	0.54	D
5	Two-Lane Highway	SR-1 between Carlos St and Vallemar St	2800	1058	0.38	D	1298	0.46	D	1496	0.53	D
6	Two-Lane Highway	SR-1 between Vallemar St and California St	2800	1018	0.36	D	1247	0.45	D	1454	0.52	D
6	Two-Lane Highway	SR-1 between California St and Vermont St	2800	1205	0.43	D	1355	0.48	D	1518	0.54	D
7	Two-Lane Highway	SR-1 between Vermont St and Cypress Ave	2800	1182	0.42	D	1394	0.50	D	1540	0.55	D
8	Two-Lane Highway	SR-1 between Cypress Ave and St. Etheldore St	2800	1123	0.40	D	1356	0.48	D	1544	0.55	D
9	Two-Lane Highway	SR-1 between St. Etheldore St and Capistrano Rd N	2800	1181	0.42	D	1414	0.51	D	1547	0.55	D

Roadway Segment Number	Class	Location	Capacity	Existing Condition								
				AM			PM			Sat Midday		
				Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]
10	Two-Lane Highway	SR-1 between Capistrano Rd N and Coral Reef Ave	2800	1201	0.43	D	1408	0.50	D	1607	0.57	E
11	Two-Lane Highway	SR-1 between Coral Reef Ave and Capistrano Rd S	2800	1115	0.40	D	1294	0.46	D	1502	0.54	D
12	Two-Lane Highway	SR-1 between Capistrano Rd S and Coronado St	2800	1132	0.40	D	1442	0.52	D	1250	0.45	D
13	Two-Lane Highway	SR-1 between Coronado St and Medio Ave	2800	**1662**	**0.59**	**E**	**1947**	**0.70**	**E**	2017	0.72	E
14	Two-Lane Highway	SR-1 between Medio Ave and Miramar Dr	2800	**1682**	**0.60**	**E**	**1961**	**0.70**	**E**	2112	0.75	E
15	Two-Lane Highway	Between Miramar Dr and Mirada Rd	2800	**1650**	**0.59**	**E**	**1932**	**0.69**	**E**	2205	0.79	E
16	Two-Lane Highway	Between Mirada Rd and Guerrero St	2800	**1647**	**0.59**	**E**	**1884**	**0.67**	**E**	2199	0.79	E
17	Two-Lane Highway	Between Guerrero St and Roosevelt Blvd	2800	1574	0.56	D	**1938**	**0.69**	**E**	2064	0.74	E
18	Two-Lane Highway	Between Roosevelt Blvd and Young Ave	2800	**1703**	**0.61**	**E**	**1992**	**0.71**	**E**	2210	0.79	E
19	Two-Lane Highway	Between Young Ave and Ruisseau Francais Ave	2800	**1741**	**0.62**	**E**	**2054**	**0.73**	**E**	2264	0.81	E
20	Two-Lane Highway	Between Ruisseau Francais Ave and Frenchmans Creek Rd	2800	**1796**	**0.64**	**E**	**2040**	**0.73**	**E**	2199	0.79	E

Roadway Segment Number	Class	Location	Capacity	Existing Condition								
				AM			PM			Sat Midday		
				Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]
21	Two-Lane Highway	Between Frenchmans Creek Rd and Venice Blvd	2800	**1837**	**0.66**	**E**	**2140**	**0.76**	**E**	2403	0.86	E
22	Two-Lane Highway	Between Venice Blvd and Frontage Rd	2800	**1748**	**0.62**	**E**	**2038**	**0.73**	**E**	2073	0.74	E
23	Two-Lane Highway	Between Frontage Rd and Spindrift Wy	2800	**1771**	**0.63**	**E**	**2059**	**0.74**	**E**	2286	0.82	E
24	Two-Lane Highway	Between Spindrift Wy and Kehoe Ave	2800	**1797**	**0.64**	**E**	**2036**	**0.73**	**E**	2177	0.78	E
25	Two-Lane Highway	Between Kehoe Ave and Grandview Blvd	2800	**1868**	**0.67**	**E**	**2168**	**0.77**	**E**	2397	0.86	E
26	Two-Lane Highway	Between Grandview Blvd and Terrace Ave	2800	**1933**	**0.69**	**E**	**2251**	**0.80**	**E**	2470	0.88	E
27	Multi-Lane Highway	From Terrace Ave to Silver Ave	4400	1404	0.32	B	997	0.23	A	1291	0.29	A
	Multi-Lane Highway	From Silver Ave to Terrace Ave	1400	676	0.48	D	1449	1.04	F	1358	0.97	E
28	Multi-Lane Highway	From Silver Ave to Belleville Blvd	4400	1406	0.32	B	1006	0.23	A	1327	0.30	B
	Multi-Lane Highway	From Belleville Blvd to Silver Ave	4400	668	0.15	A	1464	0.33	B	1369	0.31	B
29	Multi-Lane Highway	From Belleville Blvd to North Main St	4400	1368	0.31	B	1000	0.23	A	1302	0.30	A

Roadway Segment Number	Class	Location	Capacity	Existing Condition								
				AM			PM			Sat Midday		
				Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]
	Multi-Lane Highway	From North Main St to Belleville Blvd	4400	665	0.15	A	1455	0.33	B	1347	0.31	B
30	Multi-Lane Highway	From North Main St to SR 92	4400	980	0.22	A	717	0.16	A	869	0.20	A
	Multi-Lane Highway	From SR 92 to North Main St	4400	590	0.13	A	864	0.20	A	899	0.20	A
31	Multi-Lane Highway	From SR 92 to Pine Ave	4400	837	0.19	A	1171	0.27	A	1182	0.27	A
	Multi-Lane Highway	From Pine Ave to SR 92	4400	1012	0.23	A	1018	0.23	A	1104	0.25	A
32	Multi-Lane Highway	From Pine Ave to Kelly Ave	4400	807	0.18	A	1155	0.26	A	1179	0.27	A
	Multi-Lane Highway	From Kelly Ave to Pine Ave	4400	1030	0.23	A	1016	0.23	A	1025	0.23	A
33	Two-Lane Highway	Between Kelly Ave and Filbert St	2800	1340	0.48	D	**1724**	**0.62**	**E**	1651	0.59	E
34	Two-Lane Highway	Between Filbert St and Poplar St	2800	1213	0.43	D	1504	0.54	D	1562	0.56	D
35	Two-Lane Highway	Between Poplar St and Grove St	2800	1024	0.37	D	1340	0.48	D	1430	0.51	D
36	Two-Lane Highway	Between Grove St and Seymour St	2800	968	0.35	D	1304	0.47	D	1340	0.48	D

Roadway Segment Number	Class	Location	Capacity	Existing Condition								
				AM			PM			Sat Midday		
				Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]
37	Multi-Lane Highway	From Seymour St to Higgins Canyon Rd	4400	421	0.10	A	652	0.15	A	625	0.14	A
	Multi-Lane Highway	From Higgins Canyon Rd to Seymour St	4400	524	0.12	A	686	0.16	A	604	0.14	A
38	Multi-Lane Highway	From Higgins Canyon Rd to Wavecrest Rd	4400	474	0.11	A	727	0.17	A	691	0.16	A
	Multi-Lane Highway	From Wavecrest Rd to Higgins Canyon Rd	4400	570	0.13	A	681	0.15	A	694	0.16	A
39	Two-Lane Highway	Between Redondo Beach Rd and Fairway Dr	2800	1005	0.36	D	1298	0.46	D	1325	0.47	D
40	Multi-Lane Highway	From Fairway Dr and Miramontes Point Rd	4400	240	0.05	A	442	0.10	B	632	0.14	B
	Multi-Lane Highway	From Miramontes Point Rd to Fairway Dr	4400	352	0.08	A	444	0.10	B	544	0.12	B
41	Two-Lane Highway	Between Miramontes Point Rd and Dehoff Canyon Rd	2800	371	0.13	B	531	0.19	C	813	0.29	C
42	Multi-Lane Highway	SR 92 from SR 1 to Main Street	4400	849	0.19	A	541	0.12	A	612	0.14	A
	Multi-Lane Highway	SR 92 from Main St to SR 1	4400	264	0.06	A	751	0.17	A	695	0.16	A
43	Two-Lane Highway	SR 92 between Main Street and R Rd	2800	**1599**	**0.57**	**E**	**2047**	**0.73**	**E**	1900	0.68	E

Roadway Segment Number	Class	Location	Capacity	Existing Condition								
				AM			PM			Sat Midday		
				Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]
44	Two-Lane Highway	SR 92 between R Rd and Muddy Road	2800	**1670**	**0.60**	**E**	**1873**	**0.67**	**E**	1689	0.60	E
45	Two-Lane Highway	SR 92 between Muddy Road and Skyline Blvd	2800	**1663**	**0.59**	**E**	**1890**	**0.68**	**E**	1553	0.55	D
46	Two-Lane Highway	SR 92 between Skyline Blvd and SR 35	2800	1259	0.45	D	1220	0.44	D	1258	0.45	D
47	Two-Lane Highway	SR 92 between SR 35 and I-280	2800	1495	0.53	D	**1705**	**0.61**	**E**	1859	0.66	E

[1] **Bolded** segments fall below the defined LOS standard.

Transit

Existing transit service to the Study Area is provided by the San Mateo County Transit District, which operates SamTrans, the regional bus service; and RediCoast, a paratransit service.

Fixed Route Transit Service

Just two fixed route transit services operate in or near the Study Area. These services provide north-south and east-west transit access within the Study Area at headways that range from 30 minutes in the peak to 120 minutes in the off-peak. Given its limited coverage and low frequency, transit is unable to function as a primary mode of transportation for most discretionary transit riders; those riders who have the option of using another mode of transportation.

Key features of existing fixed route transit services are summarized in Table 4, and displayed in Figure 2.

Table 4: Fixed Route Transit Services

Route	Agency	Description	Peak Headway (min)	Off Peak Headway (min)	Span of Service
17	SamTrans	Pacifica – Pescadero (weekday) Pacifica – Miramontes Point (weekend)	30	60 weekdays 120 weekends	6 AM – 9 PM
294	SamTrans	Half Moon Bay – Hillsdale Caltrain	60	120	6 AM – 9 PM
Devil's Slide Ride	City of Pacifica	Devil's Slide Trail – Oceana Terrace Senior Housing	75	100	8 AM – 5 PM

SamTrans Route 17

Route 17 is a coastal community service bus that runs weekday service connecting Pacifica (just north of the Study Area) to Montara, Moss Beach, El Granada, Half Moon Bay, and Pescadero. Weekend service terminates at Miramontes Point, before reaching Pescadero. Route 17 operates along Cypress Avenue, Airport Street, and Capistrano Road in the Study Area, operating all days of the week between 5:30 AM and 9:30 PM. This line has 30-minute headways during weekday mornings, which increase up to 2 hours for the rest of the day as well as on weekends.

SamTrans Route 294

Route 294 is a regional express bus that connects Half Moon Bay to the other half of San Mateo County located along the San Francisco Bay. It is a vital link to the Hillsdale Caltrain station in San Mateo and the rest of the Bay Area. Route 294 operates along California State Route 92

between Half Moon Bay and the City of San Mateo. This line operates all days of the week between 5:30 AM and 9:00 PM, with headways that range from 1 to 2 hours.

Private Shuttle Services

The City of Pacifica offers the Devil's Slide Ride, a free shuttle which runs every 75 minutes on weekends from 8:00 AM to 5:00 PM between the Linda Mar Shopping Center in Pacifica, Devil's Slide Trail north of Montara in the south, and Oceana Terrace Senior Housing in the north.

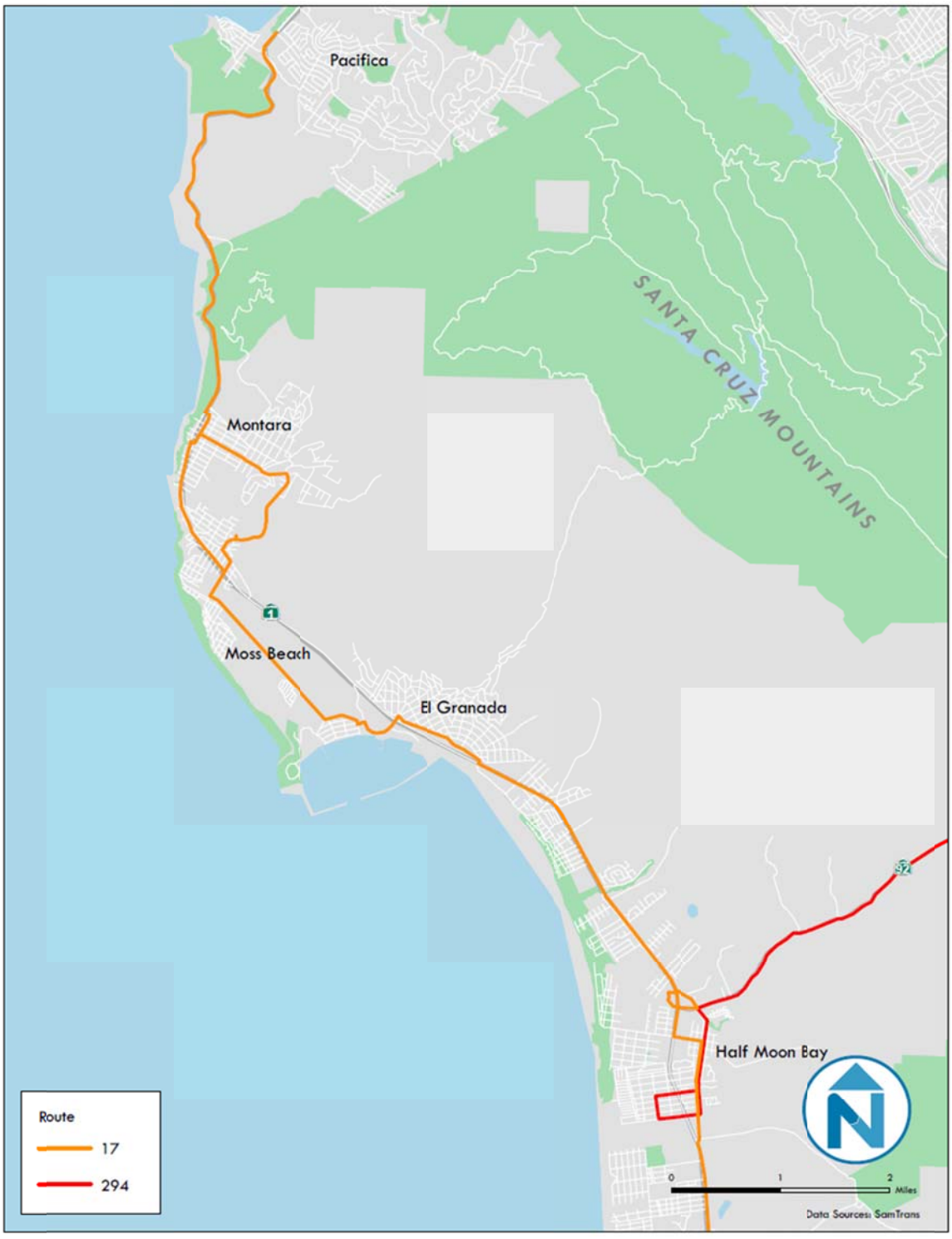


Figure 2: Existing SamTrans Fixed Route Service

Dial-a-Ride

Limited, demand-responsive transit services are available to the public residing within the Study Area under certain conditions of eligibility.

RediCoast

RediCoast is a paratransit service managed by the San Mateo County Transit District as the coastal complement to Redi-Wheels on the bay side of the county. The service is provided under the Americans with Disabilities Act of 1990 (ADA).

RediCoast provides curb-to-curb transportation for disabled citizens living between Devil's Slide in the north and the border of Santa Cruz County in the south, including Princeton, Moss Beach, El Granada, and several other coastal communities. Travel outside of these areas is possible through arrangement with respective paratransit providers (e.g. Redi-Wheels for eastern San Mateo County, Outreach for Santa Clara County, etc.). RediCoast operates weekdays between 6:30 AM and 8:00 PM, and weekends and holidays between 8:00 AM and 5:00 PM. As of 2013, the cost for a one-way trip is $3.75.

Disabled citizens qualify for RediCoast services if any of the following conditions are met:

- The person is unable to meet the physical, visual, or communicatory requirements to safely and efficiently complete their trip using a fixed route bus; or
- The bus service is not accessible to the person; or
- The person cannot independently travel from their home to the bus stop.

Personal attendants are allowed to ride free with proper certification and notice, and other companions are allowed to ride on a space-available basis with fare payment and prior notice.

Bicycle

Bicycle infrastructure has been classified into the following types of facilities, with design guidance provided by the Caltrans Highway Design Manual:

Class I	Multi-use, paved paths that are separated from vehicular traffic, and enable two-way travel for bicyclists and pedestrians
Class II	On-street striped and signed lanes for bicyclists
Class III	Shared right-of-way for bicyclists and motorists, with "sharrow" symbols on the pavement to indicate that the roadway is to be shared with bicyclists

In 2014, Caltrans endorsed the National Association of City Transportation Officials (NACTO)'s Urban Street Design Guide, as a supplement to the state's Highway Design Manual and Manual of Uniform Traffic Control Devices (MUTCD). Assembly Bill 1193 also allowed jurisdictions to choose other guidelines such as the NACTO's Urban Bikeway Design Guide for design of their bicycle facilities. In particular, AB1193 permitted construction of cycle tracks (also known as protected bicycle lanes) and required Caltrans to provide design guidelines on these new "Class IV" facilities.

The California Coastal Trail ranges from Class I facilities to unclassified dirt paths in various sections along the coastline. Class I, II, and III facilities are present in Half Moon Bay, along Highway 1, SR 92, and Kelly Avenue.

Cyclists use Highway 1 as an intercommunity route along the coast, since it is the only direct and continuous north-south connection. Highway 1 has wide paved shoulders (typically 8 foot wide) in some areas, but no bicycle accommodation through the most dangerous points along the route, that is, through intersections. Instead, the intersections feature large corner radii and wide cross-sections that are designed to optimize conditions for fast-moving motor vehicles but make the facility more dangerous, inaccessible and uncomfortable for bicycles and pedestrians.

Some avid recreational cyclists use SR 92 as one of a handful potential coastal access routes. SR 92 has wide paved shoulders in some areas, but these narrow or disappear along significant segments of the route including more rugged and settled portions of the route.

Again, the lack of bicycle facilities providing safe bicycle accommodation along key routes, and through intersections, in the Study Area, conflicts with the County's Policy of Complete Streets and exacerbates the problems of automobile dependence and motor vehicle congestion within the area, especially during commute hours and peak summer tourist times.

A map of existing and planned bicycle facilities in the Study Area is shown in Figure 3.

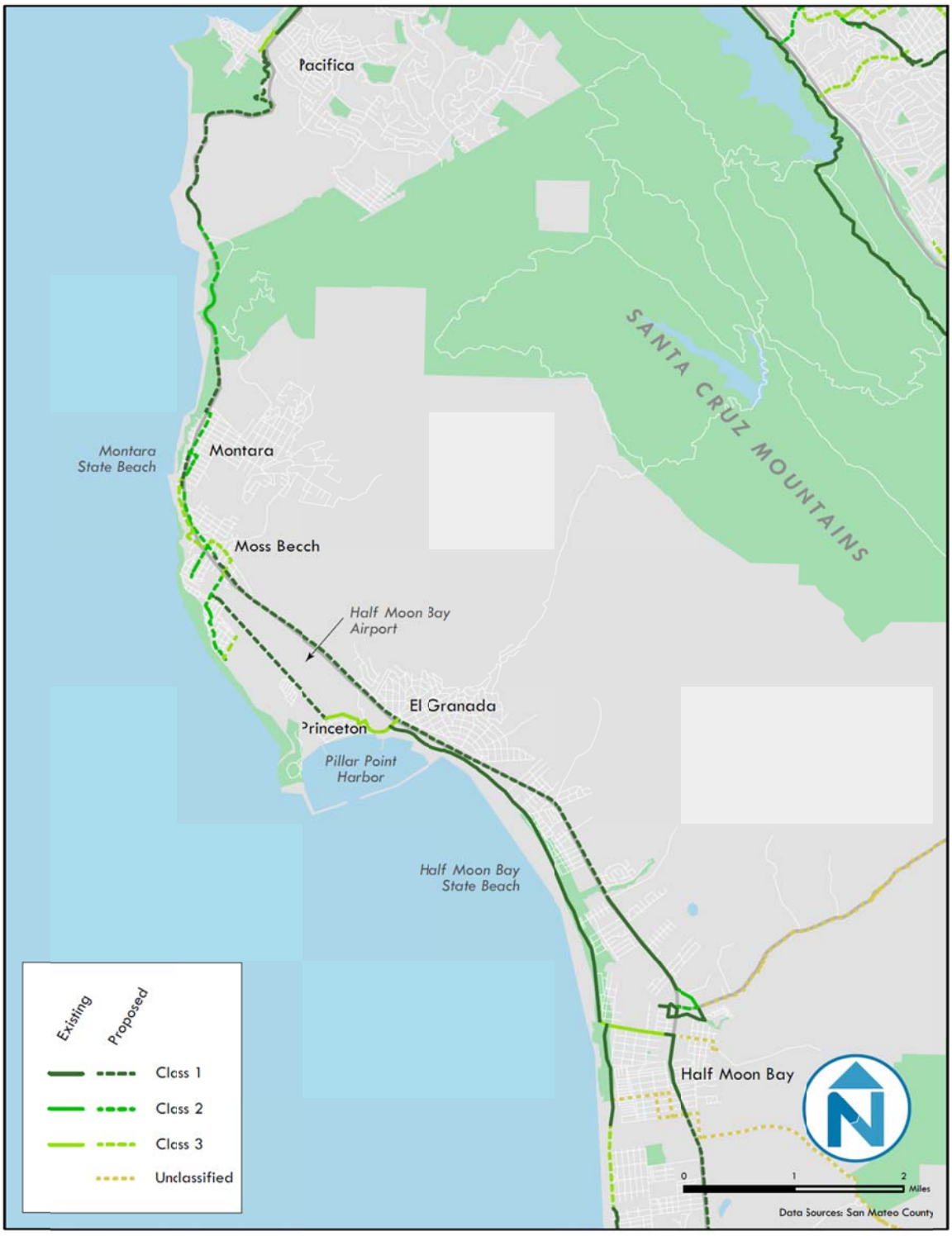


Figure 3: Bicycle Facilities in Study Area

Planned Bicycle and Pedestrian Facilities

Priorities for enhanced bicycle and pedestrian facilities throughout the Study Area are identified in the 2011 San Mateo Comprehensive Bicycle and Pedestrian Plan (CBPP), Highway 1 Safety and Mobility Improvement Study, and specifically the Design Guidelines for Pedestrian Focus Areas. These improvements will provide facilities where few currently exist, and address mobility and accessibility barriers often encountered by low-income riders, agricultural workers, and transit users (for first- and last-mile trips) who are already biking and walking along Highway 1 and SR 92.

Planned Facilities along Highway 1 / California Coastal Trail / Parallel Trail

Proposed improvements to Highway 1, California Coastal Trail, and the planned Parallel Trail will improve its bicycle "level of service" as a countywide bicycle corridor, and enhance mobility for pedestrians in the area. The Parallel Trail would be a bicycle and pedestrian facility adjacent to Highway 1 and the Coastal Trail from Montara to Half Moon Bay, and composed of Class I and Class II bike facilities. These facilities will be part of the proposed North Coast Bikeway in the CBPP, connecting Daly City, Pacifica, and Half Moon Bay.

Key pedestrian elements for the Highway 1 corridor that are identified in the plans include building new pedestrian pathways and more frequent and consolidated crossings for residents and visitors alike. Sidewalks would be constructed in developed areas or along access routes to recreational areas. According to the 2011 Comprehensive Bicycle and Pedestrian Plan (CBPP), pathways that range in width from just 4-feet to 12-feet would be built in undeveloped areas that feature pedestrian activity. It should be noted that under the ADA standards, 5 feet is the minimum width required to allow two wheelchairs (or strollers) to pass. Where sidewalks are less than 5-feet wide, the ADA standards require passing spaces to be constructed at least every 200 feet.

In conjunction with the development of these sidewalk facilities, current plans propose existing sidewalks to be upgraded with vertical curb and gutters. Uncontrolled crossings would be enhanced with high-visibility striping and infrastructure, and median islands used as refuges to shorten crossings where possible. Developed areas would have a limit of 600 feet between crossings along corridors.

Other focus areas identified in the above plans include pedestrian-scale lighting in developed areas, landscaped buffers at a minimum width of 5 feet where possible, and clearing pathways of debris for both cyclists and pedestrians.

Planned Facilities along SR 92

The 2011 CBPP identifies State Route 92 (SR 92) as a key corridor for bicycle and pedestrian facilities. Proposed improvements include a Class I bicycle facility in Half Moon Bay and an unclassified on-street bicycle facility between the city limits of Half Moon Bay and Highway 35.

Key Projects identified in the 2000 San Mateo County Comprehensive Bicycle Route Plan and 2011 Comprehensive Bicycle and Pedestrian Plan are listed in Table 5. While the 2011 plan supersedes the 2000 plan many of the project and alignment recommendations from the 2000

plan have been carried over to the 2011 plan. The level of specificity regarding dimensions was greater in the 2000 plan so for that reason detailed recommendations from the 2000 plan are shown as well for those projects that are included in both plans.

Table 5: Planned Bicycle and Pedestrian Facilities

Project	Jurisdictions	Description of Identified Priorities	Status
Coastside Bikeway Projects	San Mateo County, Half Moon Bay	Improvements to SR 92 between Half Moon Bay and Highway 280, including: - Improvements to SR 92/SR 35 intersection - 7-foot shoulders on SR 92 between Hwy 1 and SR 35 - Pathway along SR 92 between SR 35 to I-280 bike-ped overcrossing. Extension of multiuse coastal trail along Highway 1 north and south from Half Moon Bay.	San Mateo County: portions of the coast side trail project. Half Moon Bay: Construction of multi-use path along Highway 1.
North Coast Bikeway	Pacifica, Daly City, Half Moon Bay	Pathway, wide shoulders, directional signing connecting Daly City, Pacifica and Half Moon Bay, including multiuse path on Highway 1.	Daly City: Bike lanes on Southgate Avenue Pacifica: Bike lanes on Palmetto Avenue, bike path along most of Highway 1 to San Pedro Mountain Road
Highway 1 / Coastal Trail / Parallel Trail Improvements		Sidewalks in developed areas or access routes to recreation areas; 4' – 12' pathway in un-developed areas with pedestrian activity Vertical curb and gutter where sidewalks exist Obstacles removed from pedestrian way ADA-compliant curb ramps Pedestrian-scale lighting in developed areas Minimum 5' landscape buffer where possible On-street parking buffer in developed areas Crossings at key desire lines High visibility, enhanced crossings at uncontrolled locations Median islands Max 600' between crossings in developed areas Regular transit service during peaks in developed areas Convenient transit stops in developed areas Connected bike network	
Major		10' - 20' paths or minimum 5' detached sidewalks	

Project	Jurisdictions	Description of Identified Priorities	Status
Barrier Crossings		with wider pathways where high pedestrian and/or bicycle demand is expected Minimum 12' path if there is vertical enclosure Obstacles removed from pedestrian way ADA-compliant curb ramps Pedestrian-scale lighting, at crossings at a minimum Maximum of 1 mile between crossings Marked crossings at signalized and stop controlled locations on access routes to barrier crossing Connected bike network	

Pedestrian

The pedestrian network in western San Mateo County is generally comprised of local sidewalks, intermittent crossings at signalized town intersections, and the public multi-use trail system. In some locations, sidewalks require maintenance, while in others sidewalk facilities are absent altogether. In these places without designated facilities, pedestrians walk along paved shoulders in the roadway. Given the higher traffic speeds, coastal access and community arterial function of Highways 1, this lack of accommodation of pedestrians presents a safety concern in the area. It also conflicts with the County's policy on Complete Streets and fails to comply with ADA guidelines for paths of travel to key locations (including transit stops).

Crossings

All marked crossings are located at intersections of Highway 1, SR 92, and local streets. These crossings are primarily clustered in the communities of Half Moon Bay, El Granada, and Princeton/Pillar Point Harbor. Marked crossings are absent in the communities of Moss Beach and Montara. Existing crossings are primarily located at areas of dense residential land uses, and are notably missing from most recreational access points such as trailhead parking lots and designated vista points.

Visitors are required to cross Highway 1 from parking lots or shoulders without sidewalks located on the eastern edge, often with minimal pedestrian infrastructure or signage to alert drivers of potential pedestrian crossings. Potential sites for improvements include Highway 1 between Coronado Street and Pillar Point Harbor, trailhead parking north of Martini Creek, and beach parking at Gray Whale Cove State Beach. Improved pedestrian crossings and accessibility are a priority given that these highways are embedded as major arterials in coastal communities, where Highway 1 bisects or separates neighborhoods and parking areas from the coast.

There is a general lack of marked crossings in the Study Area. As shown in Figure 4, a number of vehicle-pedestrian collisions have occurred at unmarked crossings, including the potential improvement locations named above. Existing crossings use two parallel transverse lines, a

design that has since been shown to have lower visibility for drivers than alternatives such as continental crosswalks (also known as zebra striping). Some studies[6] have claimed that low-visibility treatments can be even more dangerous than no crossing treatment because they provide pedestrians with a false sense of security and expectation that motorists will yield.

Given the high speed conditions and the triple purpose of Highway 1 (as State Route, local arterial and coastal access facility), more effective crossing facilities are needed at all key crossing points along the route. The Congestion Management Project, which is currently being developed, has investigated potential long-term solutions to address this issue which include continental crossings in combination with Pedestrian Hybrid Beacons (also known as PELICAN signals), HAWK beacons, Rectangular Rapid Flash Beacons (RRFBs), or in-road warning lights. For example, high visibility continental crossings combined with RRFBs have been successfully used for coastal highway crossings in Astoria, Oregon. To prevent potential rear end collisions when motorists stop for pedestrians in the crosswalk, two installations of the beacons can be used at a distance of 150 feet. This gives drivers advance notice that someone is in the crossing and provides time to effectively decelerate from highway speeds.

Trails and Coastal Access

The California Coastal Trail (CCT) is a scenic, recreational public trail system envisioned to be continuous along the California coast. The CCT is comprised of several different facility types within the Study Area, ranging from sporadically paved multi-use paths in Half Moon Bay to unpaved dirt trails north of Princeton to connections along the roadway shoulder in Montara. The CCT is intended to serve pedestrians primarily, but also accommodates many other users, including cyclists, wheelchair users, and equestrians.

Existing portions of the CCT run in a north-south direction west of Highway 1. The trail is currently paved and separated from the highway between the City of Half Moon Bay and Pillar Point Harbor, transitioning to an on-street route through Princeton, to a multi-purpose dirt path along the Pillar Point bluffs to Seal Cove in Moss Beach.

There are a number of beaches, scenic viewpoints, and other attractions along the coastline. When these destinations are accessed by foot, pedestrians often walk directly there via local streets, parking lots, or, at times, privately owned property (where owners allow users to access public beaches, for example).

A map of existing pedestrian crossings and the California Coastal Trail is shown in Figure 4.

[6] Crosswalk markings and the risk of pedestrian-motor vehicle collisions in older pedestrians, Thomas Koepsell, MD, MPH; et al.
Journal of the American Medical Association JAMA 288 (2002): 17(November 6) p. 2136-2143.

Figure 4: Pedestrian Facilities in Study Area

Parking

The following section describes on- and off-street parking conditions by study sub-area. Information on parking restrictions is provided where applicable.

On-Street Parking

North of Montara

There is a collection of seven roadway pullouts located along both sides of U.S. Highway 1 within this segment. These facilities are not paved or regulated for long-term parking however they are occasionally used as scenic viewpoints by recreational users.

Montara

The neighborhood streets of Montara offer free on-street parking with no time restrictions. On-street parking is used by residents as well as recreational users and restaurant patrons. During peak time periods, such as the weekends, there can be a lack of available on-street parking.

Moss Beach

Free and unrestricted street parking is widely available in the residential neighborhoods of Moss Beach. During parking counts conducted throughout the day of Saturday July 12, 2014 the residential streets surrounding the Fitzgerald Marine Reserve had an average occupancy of 93 vehicles.

Pillar Point and Half Moon Bay Airport

Throughout Princeton, on-street parking is free and there are no time restrictions. Along Capistrano Road, public on-street parking is clearly identified. However in other areas of Princeton, such as the industrial area bounded by Broadway, Princeton Avenue, Cornell Avenue, and West Point Avenue, the boundary between public and private parking along the street is not always clearly defined due to the fact that many of the streets do not have curbs. Thus, drivers park on unpaved areas between the street right-of-way and the adjacent buildings. In addition, some private property owners have placed unofficial "No Parking" signs, which make it difficult for drivers to discern between public and private parking.

No parking is allowed along West Point Avenue between Stanford Avenue and Pillar Point. On Airport Street (except the area adjacent to Pillar Ridge Manufactured Home Community), and Capistrano Road north of Prospect Street, there is no designated area for parking along the roadway, though some drivers may park on the shoulder where there is room available.

El Granada

Free and unrestricted street parking is widely available in the residential neighborhoods of El Granada. Surfers Beach is a very popular destination located between Half Moon Bay and Princeton. This beach does not have a designated parking lot, and so beach users park along Highway 1 and Burnam Strip.

Miramar

Free and unrestricted street parking is widely available in the residential neighborhoods of Miramar. Miramar Beach is a popular destination without a designated parking lot, and so drivers park along Magellan Avenue.

Half Moon Bay

On-street parking is free throughout Half Moon Bay. There are no time restrictions with the exception of Main Street, which has a two hour time limit. Within downtown the majority of parking is provided on-street with both parallel and angled on-street spaces.

A downtown parking survey was conducted from May 2011 to June 2011 to determine the location and times of the highest parking occupancy rate. May and June represent months of peak demand in Half Moon Bay, particularly during weekends. The survey showed that during this time, the average parking occupancy level in downtown Half Moon Bay was 50 percent. The highest occupancy rate (close to 100 percent) was observed during the afternoon hours. The peak weekend occupancy rate lasted from late morning to early evening on Saturdays and Sundays. Streets parallel to Main Street in downtown had much lower parking occupancy rates in comparison to Main Street.

State Route 92 (San Mateo Road)

There is no on-street parking along this largely rural highway segment.

Route 35 (Half Moon Bay Road)

There is no on-street parking located along this rural segment.

Off-Street Parking

In addition to the above on-street parking, there are many off-street parking facilities within the Study Area. Appendix A provides a summary of this off-street parking supply and whether the facilities are public or private. A map of these facilities is provided in Figure 5. It should be noted that per Coastal Commission regulations a number of restaurant lots must be open to the public during daytime hours when the restaurant is not open. The parking facilities to which this applies is noted in Appendix A. In addition, along many portions of Highway 1 vehicles park along the shoulder. However, these locations are not included in the off-street parking inventory as they are not designated parking lots.

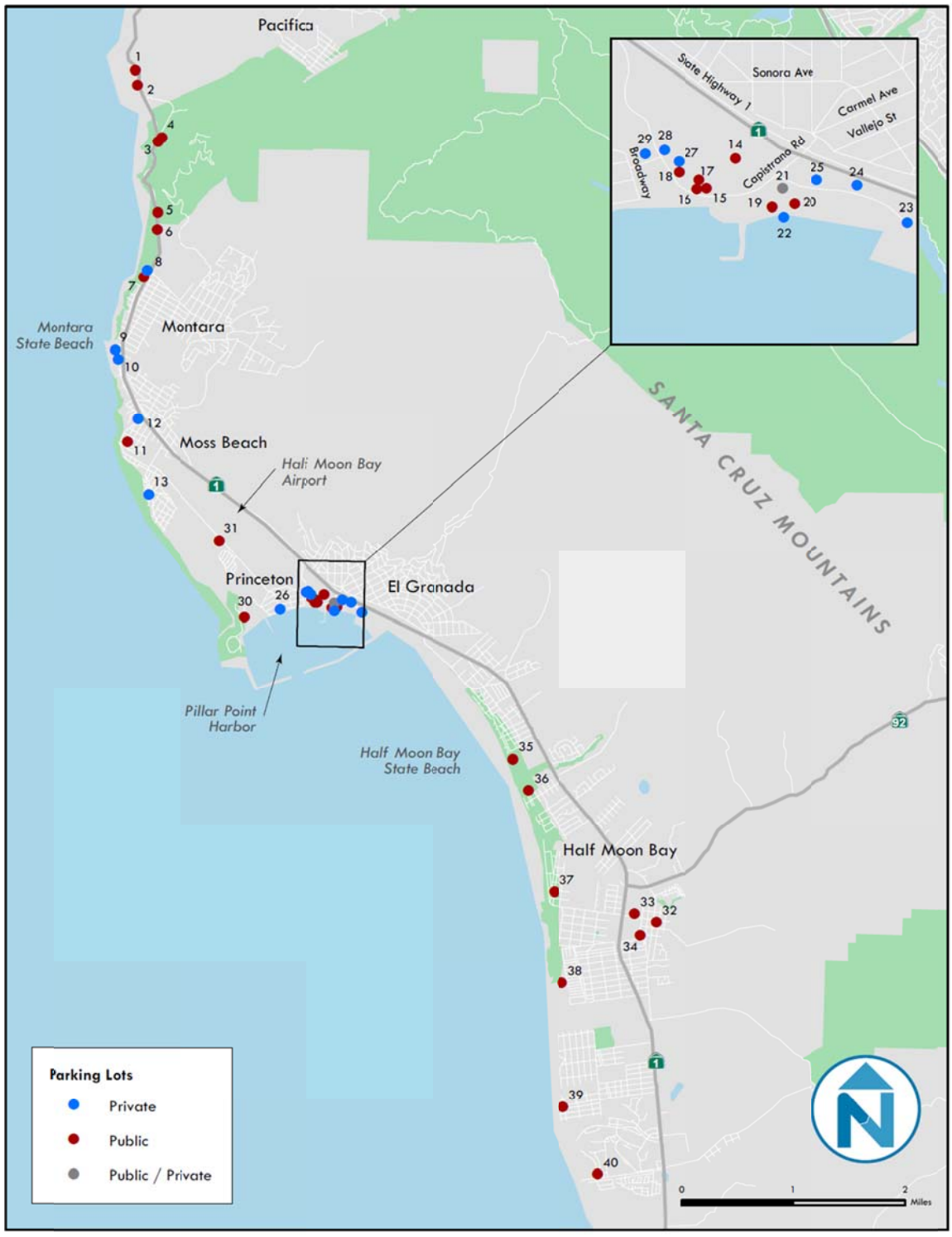


Figure 5: Study Area Parking Facilities

North of Montara

Two paved lots with a total of 24 spaces, including two disabled parking spaces, exist at the southern head of the Devil's Slide Trail located adjacent to the southern portion of the Tom Lantos Tunnels that provide access to the Old Pacific Coast Highway trailhead. The lots, which are overseen by the County of San Mateo Parks Department, are open for free parking between the hours of 8 AM and 8 PM daily. During a count done on Saturday July 12, 2014[7], occupancy of the lots ranged between 54% and 92% throughout the course of the day.

Approximately 72 (half paved and half unpaved) free parking spaces are located at Gray Whale Cove State Beach on the eastern side of U.S. Highway 1 that provide access to the Gray Whale Cove trailhead. During the counts conducted on Saturday July 12, 2014 occupancy at the lot stayed below 50% for the course of the day. In addition, Caltrans owns an unpaved surplus lot located above the main parking area with capacity for roughly 35 vehicles. During the course of observation this lot remained underutilized, which may be attributed to a lack of signage and the steep unpaved grade that provides a sole point of entry and egress.

Capacity for roughly seven vehicles exists at a small unpaved lot located on the eastern side of U.S. Highway 1 across from Montara State Beach that provides access to the McNee Ranch State Park.

An unpaved lot located on the western side of U.S. Highway 1 at Martini Creek, in the center of Montara State Beach, provides free parking to roughly 42 vehicles (including portions of the roadway shoulder). The parking area, which is popular with surfers, was at full utilization for most of the morning hours that it was observed on Saturday July 12, 2014, with occupancy rates falling to just over half during afternoon hours.

Eight paved parking spaces are provided in a small lot at the southern tip of Montara State Beach on the western side of U.S. Highway 1 adjacent to a private lot providing parking for a restaurant. Due to the lack of markings in the center of the lot and the popularity of the location, which provides beach access, occupancy at the lot when observed on Saturday July 12, 2014 was above 100% from noon onwards.

Public parking is also provided at the La Costanera Restaurant (parking ID #8 on Figure 5) until 5:00 pm per the conditions of the Coastal Commission that parking must be available to the public for beach and trail access during the day when the restaurant is not in operation.

Montara

There are no public off-street parking lots available in Montara.

Moss Beach

A paved lot located at the Fitzgerald Marine Reserve provides free public parking for up to 35 vehicles in addition to an unpaved surplus area with room for five or more vehicles and provides access to the coast. The lot, which is owned by the County of San Mateo Parks Department and open between the hours of 8 AM and 5 PM, had an occupancy rate of 50% percent during morning hours and above 100% during afternoon hours when observed on Saturday July 12, 2014. The Moss Beach Distillery has a total of 43 parking spaces of which the 14 spaces closest to the bluff are for public use from sunrise to sunset. However, these spaces are not currently posted as public spaces.

[7] Weather conditions during parking counts were mid-60's with slight mist in the morning hours.

Pillar Point and Half Moon Bay Airport

There are a number of private and public off-street parking facilities located around the harbor, near the beach, and near the Jean Lauer Trailhead in Pillar Point as well as near Half Moon Bay Airport. These lots provide a total of 1,508 parking spaces, of which 457 are public spaces, 639 are private spaces, and 412 are reserved spaces.

At Pillar Point Harbor, there is both public parking as well as permit parking. Each boater tenant with a slip is entitled to one vehicle space in the permit section in Harbor Lot A. This arrangement is a condition of the Harbor District's loan contracts with the Division of Boating and Waterways (formerly the Department of Boating and Waterways). Public parking is available free of charge in Harbor Lots A and B, which also provide customer parking for Mavericks Surf Shop, Half Moon Bay Sportfishing and Tackle Shop, and Ketch Joanne's Restaurant and Harbor Bar. The commercial lot has 40 spaces reserved for commercial fishermen. The boat launch and trailer lot has 135 spaces reserved for boaters who use the launch ramp. Their launch fee includes the right to use the lot to park their vehicle and boat trailer, and they can either purchase a yearly launch permit or a daily launch permit at the pay-and-display station located at the boat launch. Harbor Lot C also has 147 spaces and requires a permit. Persons using the harbor for boating purposes can purchase a permit for Lot C from the harbor office. Both of these facilities were constructed with money from the Division of Boating and Waterways.

The Harbor Village parking lot located behind the Oceano Hotel has both public and private parking. The approval of the project required a minimum of 398 parking spaces for the development itself, plus an additional 90 parking spaces for public/beach access parking during certain hours of the day. There are 338 spaces located in the surface lot, with additional parking located in an underground parking facility. There is currently no signage identifying that any of the parking spaces located in the surface lot are designated for public beach users or if they cannot be used by beach users.

Parking lots located along Capistrano Road between Prospect Way and U.S. Highway 1 are typically private lots for restaurant customers or hotel guests. However, there does not appear to be any enforcement of these lots, which suggests that recreational visitors may also be using them. These lots are free and do not have time restrictions.

Additionally, the Half Moon Bay Yacht Club (HYMBC) has a small supply of parking associated with its property, located inside the fence of the property as well as on Vassar Avenue and Princeton Avenue. The public uses parking located along Vassar Avenue and Princeton Avenue before the club opens. For large HMBYC events, "parking advisors" are required to direct and monitor parking around the intersection of Vassar Avenue and Princeton Avenue to ensure that access is not blocked for neighboring properties along Princeton Avenue. The Yacht Club allows various groups in the community to use the club for meetings. Therefore on some weekdays or nights all of the parking around the club is full for the duration of the event.

The Pillar Point Recreation Area lot is a small unpaved lot next to Pillar Point Marsh at the west end of West Point Avenue, where it enters the Air Force Tracking Station. This lot can accommodate 35 vehicles. There is also an unpaved lot that serves as an overflow parking on West Point Avenue near Stanford Avenue that can accommodate approximately 20 cars. There is a small unpaved lot at the Jean Lauer Trailhead located off of Airport Street which can accommodate 10 vehicles.

Discussions with numerous stakeholders found that during the week there is typically sufficient supply to meet demand and many lots are less than 50% occupied. However, in the summer, which is salmon season; on weekends; and during special events such as the Mavericks surf contest, parking nears or is at 100 percent occupancy by late morning or midday.

Half Moon Bay

There are a number of private and public off-street parking facilities located in Half Moon Bay and near the coastline. Within downtown, public off-street parking lots are located near City Hall, the Ted Adcock Community Center, and the Half Moon Bay Library. A few downtown businesses provide off-street parking for their patrons, but the majority of customer parking is provided on-street.

Public parking is provided at most vehicular access points to the coast including at the end of Young Avenue for Dunes Beach, Venice Boulevard for Venice Beach, Kelly Avenue for Francis Beach, Poplar Street for Poplar Beach, Redondo Beach Road, and Miramontes Point Road for recreational users. On the weekends and during special events these lots often fill up, resulting in spillover parking on residential streets. At state beach lots (Francis Beach, Venice Beach, and Dunes Beach) the daily parking fee is $10. The City of Half Moon Bay controls the Popular Beach lot and charges $2 per hour.

State Route 92 (San Mateo Road)

There is a paved lot with 12 marked spaces located at a scenic overlook where SR 92 and Route 35 meet. In addition there are two roughly paved parking areas on the southern side of the road adjacent to SamTrans 294 bus stops that provide parking to retail stands for Marsh Farms and Berta's Fruit Farm.

State Route 35 (Half Moon Bay Road)

There is a roughly paved (without markings) lot located on the eastern side of SR 35 at the intersection of SR 92 between Interstate 280 and the Lower Crystal Springs Reservoir with space for approximately 18 vehicles.

EXISTING TRANSPORTATION PROBLEMS AND DEFICIENCIES

Identifying deficiencies in the transportation system is vital to prioritizing improvements according to community needs and investing capital funds responsibly. This section provides a detailed analysis of existing issues and deficiencies in Half Moon Bay and the Midcoast area of San Mateo County.

Key priorities across the Study Area as a whole include the need to develop Complete Streets that serve all modes of transportation safely and conveniently, in compliance with the Countywide Complete Streets policy, and improving all facilities to serve the disabled community, in compliance with the Americans with Disabilities Act (ADA).

Midcoast

Intersection LOS

The *San Mateo County Traffic Impact Study Requirements* defines the intersection LOS standard for San Mateo County as LOS C with no individual movement operating at worse than LOS D. There is no definition of peak periods, however it is noted that a standard of LOS D during a peak period may be allowed for

dense urban conditions per County's discretion. No differentiation is made between signalized and unsignalized intersections besides the LOS standard defined for individual movements.

The LCP has an intersection standard of LOS D.

All signalized intersections within the Midcoast region operate above the LOS C standard; however several unsignalized intersections along Highway 1 have minor street approaches that operate below the LOS D standard. The following intersections do not meet the LOS standard during the listed peak hours:

- Highway 1 and 8th Street (Midday)
- Highway 1 and California Avenue (PM, Midday)
- Highway 1 and Virginia Avenue (PM, Midday)
- Highway 1 and Vermont Avenue (PM, Midday)
- Highway 1 and St. Etheldore Street (Midday)
- Highway 1 and Cypress Avenue (AM, PM, Midday)
- Highway 1 and Magellan Avenue (AM, PM, Midday)
- Highway 1 and Medio Avenue (AM, PM, Midday)
- Highway 1 and Miramar Drive (PM)

All of the intersections that operate below the standard are minor-street stop-controlled and only have one lane of approach and only Cypress Avenue has more than 50 vehicles per hour on an approach turning onto Highway 1. None of the intersections operating below the standard would meet the peak hour signal warrant.

Roadway Segment LOS

The CMP provides LOS standards for peak commuting hours for roadway segments designated to be in the CMP Roadway System. Roadway segments along Highway 1 and SR 92 within the Study Area have a LOS standard of 'E'. However, the policy defined by the LCP in assessing the need for road expansion has LOS D as the desired level of service for segments during commuter peak periods, except during recreation peak periods when LOS E is acceptable. All roadways segments within the Study Area operate above the LOS standard given in the CMP, however Highway 1 between Coronado Street and Miramar Drive operates below the stricter standard provided by the LCP.

Pedestrians and Cyclists

Street Function and Layout

Within the Study Area, the existing layout of many communities inhibits the mobility of pedestrians and cyclists. Residential subdivisions are commonly laid into large blocks that create long, circuitous paths between destinations for pedestrians, even when these destinations may be geographically close. In many cases this deficiency can be easily overcome through the provision of pedestrian and bicycle easements at key locations (such as through the end of cul-de-sacs).

Along Highway 1, the hybrid highway, beach access, and community arterial function of the road creates challenges for pedestrian and bicycle access within the Study Area. As it is currently designed, the road serves the needs of automobile movements, but fails to provide safe and adequate access or crossing facilities for pedestrians and cyclists.

Sidewalks and Bike Lanes

The Highway 1 corridor serves as the main north-south connector for cyclists and pedestrians. However, Highway 1 lacks sidewalks or even consistent, well-defined shoulder space in areas where pedestrians or bicyclists are expected to travel along the roadway. These deficiencies make it difficult and hazardous to walk or bike between Midcoast communities and coastal amenities–particularly north of Princeton, since the Coastal Trail provides a potential alternative to the south. The area also lacks easily recognizable, direct alternative walking and biking routes off of the highway that link destinations.

Areas adjacent to recreational access points such as trailheads or parking lots are also not designed with pedestrian safety in mind—there is currently minimal signage warning drivers about pedestrians crossing the highway, and no painted striping or other crossing treatments in the roadway. Consistent with the Complete Streets policy, these areas and sections of Highway 1—especially those adjacent to higher resident and visitor pedestrian activity—should have complete sidewalk networks and connecting destinations. Areas served by transit or adjacent to recreational access points must also have robust, ADA-compliant facilities.

In smaller communities such as Princeton, there is a general lack of pedestrian facilities, which can make walking difficult and dangerous. Some roadways are narrow to begin with and feature no shoulders, forcing pedestrians and vehicles to share limited space in often-perilous terrain.

Finally, along SR 92, pedestrian and bicycle facilities are almost completely non-existent. Any pedestrians and cyclists who choose to use the corridor are therefore forced to make the perilous journey along a fast-moving, heavy traffic road which lacks even shoulders for long stretches in the most important areas (developed areas and points of curvature). Based on the County's Complete Streets policy and the CBPP, non-motorized transportation facilities are needed along this corridor including Class I bike lanes between Highway 1 and 35, and a multiuse path between Highway 35 and Interstate 280.

Crossings

In addition, pedestrian access along the Highway 1 and SR 92 corridor is limited by infrequent crossing opportunities, heavy traffic volumes, high vehicle speeds, and unimproved pedestrian facilities. There are no stop controls or treatments at uncontrolled locations to help pedestrians and cyclists safely cross the highways. Highway traffic speed also poses challenges, particularly at uncontrolled crossing locations, and there are few visual cues or physical treatments to remind drivers to be aware of cross traffic.

As discussed previously, more frequent crossings (of no more than 600 feet in developed or recreational areas) were called for Highway 1 in the 2011 CBPP but these have not yet been implemented. Robust pedestrian crossing treatments and beacons are also needed at key locations along SR 92, including the intersection with Skyline Boulevard.

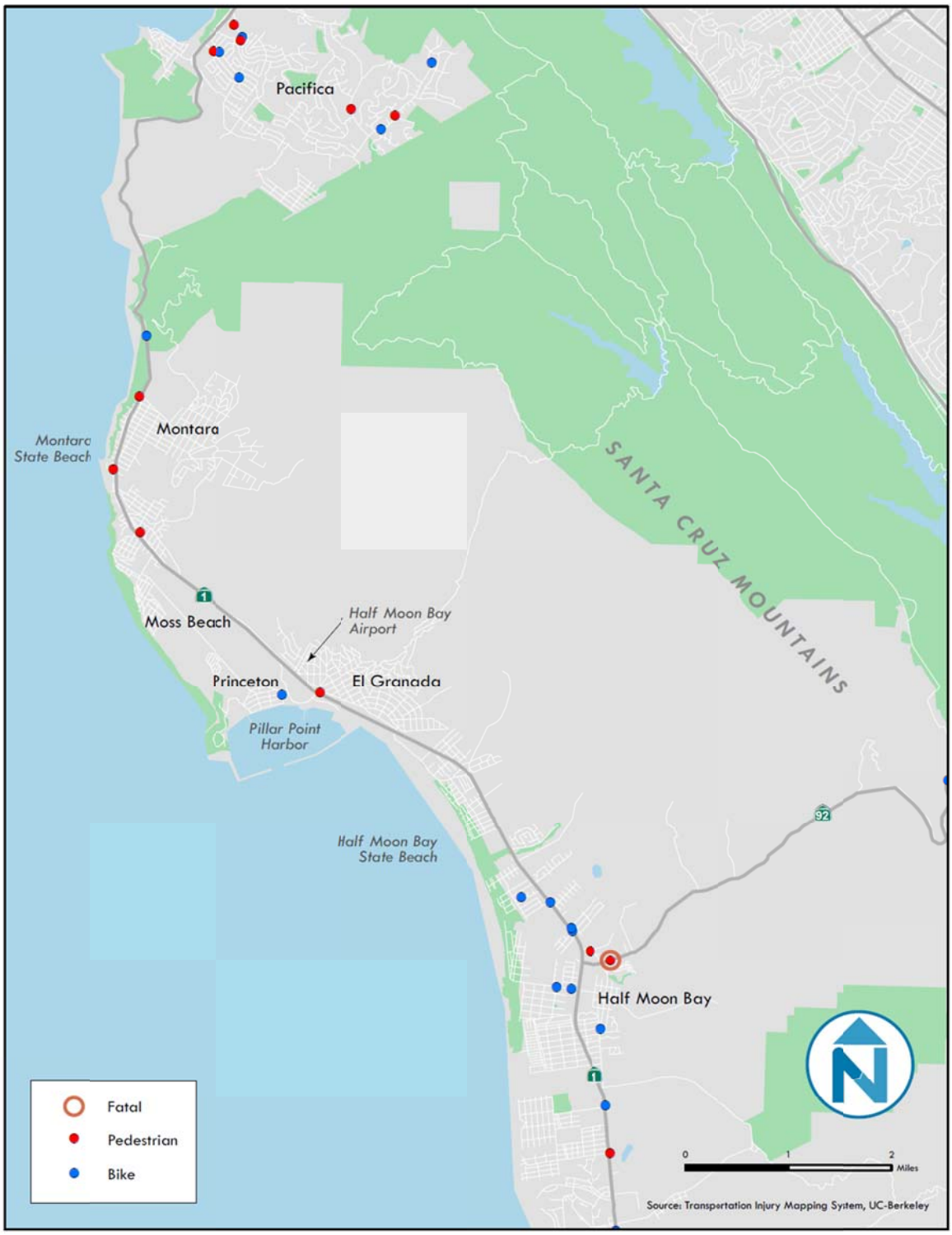
Where crossings are provided, they should be highly visible through the use of continental crossings (also known as zebra striping) in combination with other features such as Rectangular Rapid Flash Beacons (RRFBs) or in-road warning lights. In locations where motorists need to slow down from highway speeds, two installations of the beacons should be used at a distance of 150 feet.

Pedestrian and Bicycle Collisions

Between the years of 2005 and 2011 there have been a total of 363 collisions, including 25 crashes and 1 fatality involving pedestrians, cyclists, or both modal users. As shown in the map of pedestrian and

bicycle collisions in Figure 6, pedestrian and cyclist collisions were concentrated in city and town centers where the interaction between motorized and non-motorized modes is highest, as well as along Highway 1, which serves as coastal access facility and local arterial. Key concentrations of collisions occurred along Highway 1 and Main Street in Half Moon Bay. Cyclist collisions are also prevalent along rural links on Highway 1 and Highway 92 between these more urbanized centers.

Figure 6: Pedestrian and Bicycle Collisions (2005-2011)



Bicycle Parking and Amenities

Lastly, there is a lack of bicycle parking at recreational and other destinations within the Study Area. The addition of bicycle parking at major waterfront destinations can provide cyclists with more secure places to store their bikes, and can help encourage cycling throughout the Study Area. Additionally, other amenities such as lockers and showers can make cycling a more viable option for workers commuting to workplaces within the Study Area.

Transit

Current transit services are characterized by exceedingly low headways, which make it virtually impossible to use public transportation as a primary mode of travel for all types of trips in the Midcoast. SamTrans' north-south-running bus route number 17 operates at 60 to 120 minute headways in the off-peak and 30 minute headways in the peak, while route 294 operates at headways of 120 minutes. This low level of service is only capable of serving the most disadvantaged riders or those with completely rigid schedules.

In addition, a lack of safe and adequate pedestrian and bicycle facilities throughout the Study Area, results in poor and often inaccessible paths of travel to bus stops, which further limits potential transit ridership and performance within the Study Area.

At the stops themselves, there is currently a lack of amenities such as benches, shelters, and trash cans for transit riders. This results in uncomfortable and undignified conditions for transit riders as they wait for up to two hours for a bus.

Additional transit service (particularly for major visitor events), improved stop access, enhanced bus stop amenities, and targeted marketing could serve to increase transit ridership within the area. Every transit stop should also be viewed as an opportunity to provide an enhanced and effective pedestrian crossing, since transit users typically need to cross the street at either the beginning or the end of their trips.

Parking

Within the Study Area, there is generally sufficient parking supply to meet demand, though parking demand can outstrip supply during major events such as the Mavericks Invitational surf competition.

It can be somewhat unclear at tourist destinations such as the Harbor Village in Princeton where off-street spaces are available for public use. In smaller communities such as Princeton, Moss Beach and Montara, it can be difficult to determine which areas are within the public right-of-way and which are private property. Signage is a relatively-low cost solution to better inform visitors of where they can park and if there are any parking restrictions. Signage should also be added and consistent across all recreational lots and scenic pullouts notifying drivers of public parking availability and providing way-finding information to reach these spots.

The use of permit parking and reserved parking policies in some parts of the Study Area is likely to result in inefficiencies in parking. Instead shared parking policies, improved way-finding, and better alternative mode access (transit, bike and walking) can dramatically improve the performance of current parking supply and prevent the need for expansion of these facilities.

Half Moon Bay

Intersection LOS

The CMP intersections of Highway 1/SR 92 and Main Street/SR 92 are the only CMP intersections within the Study Area. The Highway 1 and SR 92 intersection has a CMP LOS standard of 'E' and the intersection of Main Street/SR 92 has a CMP LOS standard of 'F'. Both CMP intersections operate above their respective LOS standard, however the intersection of Main Street/SR 92 falls below the Half Moon Bay standard during the Midday peak hour.

The City of Half Moon Bay has a standard of LOS C for intersections along Highway 1 and SR 92, except during the peak two-hour commuting period on weekdays and the ten-day peak recreational hour[8] on weekends when LOS E is acceptable. No standards are defined for intersections not along Highway 1 and SR 92. No differentiation is made between signalized and unsignalized intersections.

The intersection of Highway 1 and Main Street (north) operates below the standard at LOS F during the PM peak period. All other non-CMP signalized intersections within the City of Half Moon Bay operate above the LOS E standard; however several of the unsignalized intersections along Highway 1 operate below the standard. The following intersections do not meet the LOS standard during the listed peak hours:

- Highway 1 and Mirada Road (AM, PM, Midday)
- Highway 1 and Roosevelt Boulevard (Midday)
- Highway 1 and Young Avenue (AM, Midday)
- Highway 1 and Frenchman's Creek Road (AM, PM, Midday)
- Highway 1 and Venice Boulevard (AM, PM, Midday)
- Highway 1 and Spindrift Way (AM, PM, Midday)
- Highway 1 and Kehoe Avenue (Midday)
- Highway 1 and Grandview Boulevard (AM, PM, Midday)
- Highway 1 and Terrace Avenue (AM, PM, Midday)
- Highway 1 and Filbert Street (AM, PM, Midday)
- Highway 1 and Seymour Street (Midday)

All of the intersections that operate below the standard are minor-street stop-controlled and only have one lane of approach and only Filbert Street has more than 100 vehicles per hour on an approach turning onto Highway 1. None of the intersections operating below the standard would meet the peak hour signal warrant.

East of Half Moon Bay, the following study intersections operate at LOS F:

- SR 92 and Muddy Road/Ox Mountain Landfill Road (AM, PM)
- SR 92 and Skyline Boulevard (AM, PM, Midday)

Muddy road has very low volumes entering SR 92. Skyline Boulevard has a channelized yield right turn onto SR-92 and less than 50 vehicles turning left onto SR 92. Neither intersection would meet the peak hour signal warrant.

[8] For the purpose of this report, the ten-day peak recreational hour is referred to as the Midday peak hour

Roadway Segment LOS

The CMP provides LOS standards for peak commuting hours for roadway segments designated to be in the CMP Roadway System. Roadway segments along Highway 1 and SR 92 within the Study Area have a LOS standard of 'E'. However, the policy defined by the LCP in assessing the need for road expansion has LOS D as the desired level of service for segments during commuter peak periods, except during recreation peak periods when LOS E is acceptable. While all roadways segments within the Study Area operate above the LOS standard given in the CMP, several roadway segments fall below the stricter standard provided by the LCP. The following roadway segments do not meet the LCP LOS standard during the listed peak hours:

- Highway 1 between Miramar Drive and Guerrero Street (AM, PM)
- Highway 1 between Guerrero Street and Roosevelt Boulevard (PM)
- Highway 1 between Roosevelt Boulevard and Terrace Avenue (AM, PM)
- Highway 1 from Kelly Avenue to Filbert Street (PM)
- SR 92 from Main Street to Skyline Boulevard (AM, PM)
- SR 92 between SR 35 and I-280 (PM)

Pedestrians and Cyclists

Due to development patterns of the City of Half Moon Bay, there is a lack of direct connectivity between residential neighborhoods in Half Moon Bay outside of the downtown area. Many neighborhoods were formerly agricultural fields along of Highway 1. As these agricultural fields were later subdivided into neighborhoods, through streets to adjacent neighborhoods were not constructed; so Highway 1 still serves as the primary local connector between different areas of the city for pedestrians and cyclists.

The lack of connectivity between neighborhoods means that residents must follow circuitous routes that require them to walk or bike to Highway 1 or SR 92 before they can access adjacent neighborhoods. However, Highway 1 is designed almost exclusively for motor vehicles and presents very hostile conditions as the primary north-south connector for non-motorized modes. The roadway currently lacks designated pedestrian facilities and has infrequent, and often inadequate and unsafe crossing opportunities across the heavy trafficked, high speed facility. Many intersections have no stop controls or treatments to help pedestrians and bicyclists safely cross the highway. Highway traffic speeds combined with few visual cues or physical treatments to remind drivers to be aware of cross traffic also pose challenges, particularly at uncontrolled crossing locations. The lack of signalized intersections or mid-block beacons makes it difficult for pedestrians to easily and safely cross these major roadways without walking excessively distances to reach a signalized intersection. This lack of pedestrian and bicycle access also impinges upon the area's performance and attractiveness as a tourist destination.

While the Coastal Trail provides a parallel route in the northern part of Half Moon Bay, and serves as an alternative to Highway 1, it is difficult to reach from areas east of Highway 1 due to the lack of signalized crossings along Highway 1, and it may not be the most direct route for most pedestrians. The planned Class 1 bicycle facilities along Highway 1 and SR 92 within the city limits of Half Moon Bay (outside of the city limits the type of facility that will be provided has not yet been determined) will increase safety by creating a buffer between cars and pedestrians, and will direct connections to destinations north and south of the city of Half Moon Bay.

Because bicyclists share the road with motorists, signage, lane markings, and further visibility improvements are needed to ensure bicyclist safety. Moreover, there is a need for bicycle parking and bicycle facility design, which addresses the needs of different bicycle trip types such as all-day secure parking areas, lockers, bike closets, and easy-to-use bicycle racks. The addition of bicycle parking at

major destinations such as Dunes Beach, Venice Beach, and Poplar Beach can encourage cycling by providing cyclists with a more secure place to store their bikes. In addition, developing bicycle parking standards for new development will help ensure that adequate bicycle parking is provided at all new residential and commercial buildings. These standards should address the needs of a range of cyclists who may use the facilities including avid recreational cyclists, commuter cyclists, tourists and children.

There is also an opportunity to create a more comprehensive bicycle network within the City of Half Moon Bay that provides more pleasant and direct connections between neighborhoods and to major destinations and attractions such as downtown, schools, shopping, beaches, and the Coastal Trail.

Transit

Half Moon Bay is served by two bus routes, both of which have headways of 60 minutes or more during off peak hours and weekends. This schedule makes it difficult for riders to use public transportation as a primary mode of travel. The lack of more frequent service may become a growing concern as the City's General Plan forecasts that seniors will increasingly make up a larger percentage of the city's population. With an increasingly aging population, expanded transit options will be needed to ensure access to stores, businesses, medical facilities, and social opportunities for this group as well as others.

In addition, current transit service provides limited connections between Half Moon Bay and the regional transit network including Caltrain and BART. Bus Route 294 provides access to Hillsdale Caltrain Station, however, this route only runs every 60 minutes on weekdays and the bus ride takes 30 minutes. More frequent weekday transit service that provides regional connections could encourage Half Moon Bay residents to choose public transit for their commute and provide seniors with increased access to services.

Another key gap in the existing transit network is the lack of convenient transit options for recreational visitors accessing beaches, marinas, and special events such as the Art and Pumpkin Festival. The increase in vehicular traffic generated by these events puts a strain on Highway 1 and SR 92 during weekends, and impedes mobility of local residents. Increasing transit headways on the weekend or providing additional service during major events such as the Half Moon Bay Art and Pumpkin Festival would make public transit a more viable option and make transit attractive to a greater number of people, which in turn could help mitigate weekend traffic congestion on Highway 1 and SR 92.

Lastly, existing transit stops lack amenities such as benches, shelters, and trash cans. Improving bus stops by adding amenities such as benches and bus shelters will help create a more comfortable and pleasant waiting environment for transit riders.

Parking

During special events and on weekends when additional parking demand is generated, provisions have been made to help address this demand, including allowing drivers to park along the shoulder of Highways 1 and 92 and in certain private parking facilities. However, despite offering additional parking to visitors, there is often a lack of parking availability during special events and on weekends. As a result, visitor parking spills over onto nearby residential streets. In order to accommodate this demand, the City could explore the feasibility of opening up additional private parking facilities to the public to expand the parking supply. In addition, if parking spillover continues to be a problem, the City could implement parking pricing and/or restrict on-street parking over two hours to residents with the implementation of a residential parking permit program.

In the downtown area, parking located in front of businesses is often used by employees and business owners, forcing customers to park farther away. The expansion of time limits or introduction of meter parking to some streets within the downtown area could be used to encourage employees and business owners to park farther away from their stores, opening up more convenient parking for customers.

The City's parking requirements have led to the withdrawal of some projects that would otherwise meet the city's zoning regulations as these proposed projects could not accommodate enough on-site parking, given the city's existing parking requirements. To allow for more flexibility with regard to new development, the city's parking standards could be reduced and revised to enable parking requirement adjustments or exemptions based on various factors such as a "change of use" exemption or for mixed-use projects.

PROPOSED NEW TRANSPORTATION SERVICE STANDARDS

Level of service (LOS) is a roadway and intersection rating system using letter grades from A (abundant capacity) to F (at capacity) that measures network performance for its users. For automobiles, LOS can be applied to roadway segments, but this is largely only practical on highway stretches due to the widely varying conditions of city streets. Instead, automobile LOS in cities focuses on vehicle delay and capacity at intersections, which can be forecast into future conditions with changes in geometry or traffic flow—as often occurs with new development projects.

Traditionally, automobile LOS standards have focused solely on vehicle delay and travel time, which can have detrimental effects on non-motorized users and on the implementation of Complete Streets. The 2010 Highway Capacity Manual (HCM) provides a multimodal approach, with a chapter dedicated to urban street facilities that couples level of service standards for automobiles, pedestrians, bicyclists, and transit users. Previously, these modes were outlined in specific, discrete chapters of the HCM. In communities that wish to prioritize other road users, performance metrics that support a broad array of objectives need to be considered.

With the signing of California Senate Bill 734 (SB 743), which removes vehicle LOS as a significance threshold under CEQA, there is an incentive to develop standards to address multimodal measures of effectiveness. Many cities have taken steps to modify their own LOS standards or adopt appropriate elements of the HCM, including Bay Area cities such as Livermore, San Francisco, San Jose, and Redwood City. Some communities have adopted various forms of Multimodal Level of Service (MMLOS) as their new performance standard. The experience in these cities indicates that the high data requirements and unintended negative consequences of certain types of MMLOS systems limit their utility.

This study is an important opportunity to examine new metrics that could more effectively measure and improve transportation in the County. The application of LOS is useful in many aspects of transportation planning and engineering, generally divided into two municipal procedures: development review and transportation system review. This section focuses specifically on the latter.

METRICS

One of the most important—and difficult—steps in justifying street improvements to decision-makers is the need for quantitative results with clear qualitative meaning. This demands an analytical process that is simultaneously comprehensive, cost-effective to conduct, and simple to understand. Such a delicate balance can be achieved with flexible LOS metrics that are both context-sensitive and aligned to overarching planning goals.

The primary metrics contributing to the LOS of a street must be capable of broad application across the diverse roles each street plays in the framework of the community. The functionality of a street depends on its typology, significant connections within the larger transportation grid, neighboring land uses, and modal volumes. It is vital to establish mode-specific primary metrics with these contexts in mind:

- **Street Class and Connectivity**: The "arteriality" of a road can be described as how important the road is in terms of the movement of people and goods along it. This is based on the volume of users it serves and its connections to major trip origins, destinations, and other roadways. Metrics for a highly arterial road that delivers highway traffic to the downtown core should focus on supporting automobile through movement. Metrics for a road with low arteriality that connects to a residential or recreational area might focus on pedestrian and bicycle safety and street beautification instead. San Mateo's existing "functional classification" categories of arterial, collector, and local streets can be used to define streets' arteriality.
- **Contextual Land Uses**: Metrics should reflect and reinforce the places that streets support. Neighboring land uses span a wide range, and their needs are often unique from each other. For example, ground-floor retail would benefit more significantly from comprehensive pedestrian facilities and on-street parking than an industrial zone. Conversely, an industrial zone would require large curb radii for trucks making frequent turns, which would be a very low priority in a residential area. In residential areas, low motor vehicle speeds and tree cover may be higher priorities than other considerations.
- **Modal Priority**: The modal priority of a road can dictate how important the road is for each mode traveling along it. This means that a major transit corridor with frequent bus service should use metrics that measure timely transit trips or person delay rather than vehicle delay. On a transit priority street, using an average person delay metric at intersections would be more effective than average vehicle delay, because the latter gives each bus rider roughly 1/40th the significance of a single-occupancy automobile driver (assuming the bus is carrying 40 passengers). Different metrics can be applied to recognize the modal priority of automobiles, bicycles, pedestrians, transit, or any combination of these modes.

Having secondary metrics available can be valuable for in-depth analysis and also to simplify comparisons between seemingly identical alternatives. Secondary metrics include non-mobility indicators for economic, social, and environmental success, such as:

- Employment rates along the corridor
- Commercial vacancy
- Commercial and residential property values
- Incorporation of historical or cultural elements into design
- Landscaping or decorative paving
- Percent of roadway under tree canopy
- Adequacy of stormwater runoff facilities, and more

The use of such indicators would be intended for evaluation on a case-by-case basis as needed, rather than system-wide application, and are beyond the scope of the following mode-specific metrics based on a familiar LOS A through F scale. Additional LOS standards may be applied to parking, though they are not described in detail here.

Automobile

For corridor analysis, the average travel time or speed for automobiles at peak hour (or 2nd peak hour, if peak hour is not practical) would ensure adequate performance for vehicles. Travel time can be modeled using data available in the County traffic model or empirically measured by comparing peak versus off-peak or free-flow conditions.

Transit

For corridor analysis, a suitable transit level of service analysis would focus on the likely door-to-door travel time, including access, waiting and travel times. For the access time, average distances to bus stops would be calculated based on land use configuration, street networks conditions, and impediments such as a lack of pedestrian crossing opportunities. Once at the bus stop, wait time is often perceived to be more onerous than travel time and should be weighted accordingly. Finally, travel time would use peak travel time with GPS data from SamTrans, a delay analysis from the latest comprehensive operational analysis (COA), or average speed at peak hour compared to free-flow speed. For intersection analysis, using average person delay will grant priority to transit over single-occupancy automobiles. Slower buses lower corridor transit capacity, making transit speed the primary indicator for good performance.

Bicyclists

Bicycle LOS should be based on the level of dedicated facility in comparison to proximate automobile speeds. Faster automobile speeds, such as those along Highway 1 and SR 92, merit the need for dedicated Class II bicycle lanes or Class IV cycle tracks, while lower speeds would allow Class III shared lane markings to be acceptable. Designated bicycle corridors would require higher minimum LOS standards than streets where alternative bicycle paths are available.

Pedestrians

Pedestrian metrics should focus on improving signalized and unsignalized pedestrian crossings, and include average pedestrian crossing delay, distances between designated crossings, recreational parking lot locations, as well as availability of flashing beacons, median refuges, lighting, and other safety infrastructure. In addition, pedestrian metrics should use a pass/fail metric for compliance with Americans with Disabilities Act (ADA) standards. Beyond ADA compliance, additional metrics could focus on available sidewalk width based on a wide minimum standard, a percentage of sidewalk width compared to overall full street width, or a prescribed sidewalk width according to number of travel lanes. It should also focus on the frequency, safety, and effectiveness of pedestrian crossing treatments.

LAND USE AND BUILDOUT ANALYSIS

BUILDOUT ANALYSIS METHODOLOGY

For parts of the Study Area in unincorporated San Mateo County, buildout analysis is based on assumptions used in the recent Midcoast LCP Update. Assumptions have been refined to cover both residential and non-residential development. Assumptions for Half Moon Bay draw from analysis of existing zoning and development opportunity sites in Half Moon Bay. The buildout analysis is provided for existing development and at "buildout," assumed to occur in 2040. Analysis is provided for four subareas: Half Moon Bay; Princeton; the Midcoast; and Rural Lands; and by Traffic Analysis Zone (TAZ). Figure 7 shows the Study Area and TAZs. Figure 8, Figure 9, Figure 10 and Figure 11 show existing zoning and opportunity sites in each subarea as well as TAZ boundaries.

GIS Database and Development Sites

GIS Database

Existing parcel data, existing zoning, natural features data, public lands data, and data from the County Assessor, including existing land use and (to the extent available) existing building square footage, assessed building and land value, and property ownership were synthesized. The following gaps in data required development assumptions to be made, as described at the end of this section.

- The County Assessor's data is very limited with regard to existing development.
- "Density credits" calculations for rural lands have not been provided in a way that can be used in the analysis.

Potential Development Sites

An inventory of potential development sites in each subarea was developed. For Princeton and Half Moon Bay, these sites were identified as part of those plan update efforts. For the Midcoast and Rural Lands subareas, sites were newly identified, informed by the Midcoast LCP Policies and staff reports, by an analysis of existing land use and the ratio of assessed value to land value, and map verification. Potential development sites for each subarea are summarized below.

Half Moon Bay

Existing land use data was refined based on visual analysis, and categories were streamlined. Opportunity sites are defined as follows:

- Vacant land;
- Single-family residential parcels greater than two acres;
- Underutilized land, defined as non-residential sites where the value of permanent improvements on the site was assessed as less than half the value of the property.
- Land in Planned Unit Development (PUD) districts was calculated separately;
- Land with current or planned development projects was considered separately.

- Land owned by public agencies or land trusts is excluded.

Princeton

Existing land use data was refined based on visual analysis, and categories streamlined. Opportunity sites are defined as follows:

- Vacant land;
- Open storage yards, which are common in this subarea;
- Underutilized land, defined as non-residential sites where the value of permanent improvements on the site was assessed as less than the value of the property. This is a larger set of sites than is likely to experience redevelopment during the planning horizon. However, it is especially important to provide a conservative analysis for this subarea, in order to ensure airport land use compatibility.
- Land with current or planned development projects was considered separately.
- Land owned by public agencies or land trusts is excluded.

Midcoast

Existing land use data was refined based on visual analysis, and categories streamlined. Opportunity sites defined as follows:

- Vacant land;
- Single-family residential parcels greater than one acre;
- Underutilized commercial land, defined as non-residential sites where the value of permanent improvements on the site was assessed as less than half the value of the property.
- Land with current or planned development projects was considered separately.
- Land owned by public agencies or land trusts is excluded.

Rural Lands

Existing land use data was refined based on visual analysis, and categories streamlined. Opportunity sites defined as vacant or agricultural land, with development assumptions based on the "density credits" calculation in the LCP and current zoning. Land owned by public agencies or land trusts is excluded.

Development Assumptions

Assumptions were made to estimate (1) the amount of existing development, for parcels for which this data was not included in the Assessor's data file, and (2) the amount and type of future development projected on "opportunity sites." Assumptions followed those of the San Mateo County Midcoast LCP Update and the Plan Princeton effort, where relevant. Development assumptions for both residential and non-residential development were refined based on what is allowed by zoning, the typical density and intensity of existing development, and regulatory constraint factors, and are summarized by subarea In Appendix B.

Figure 7:
CTMP Study Area

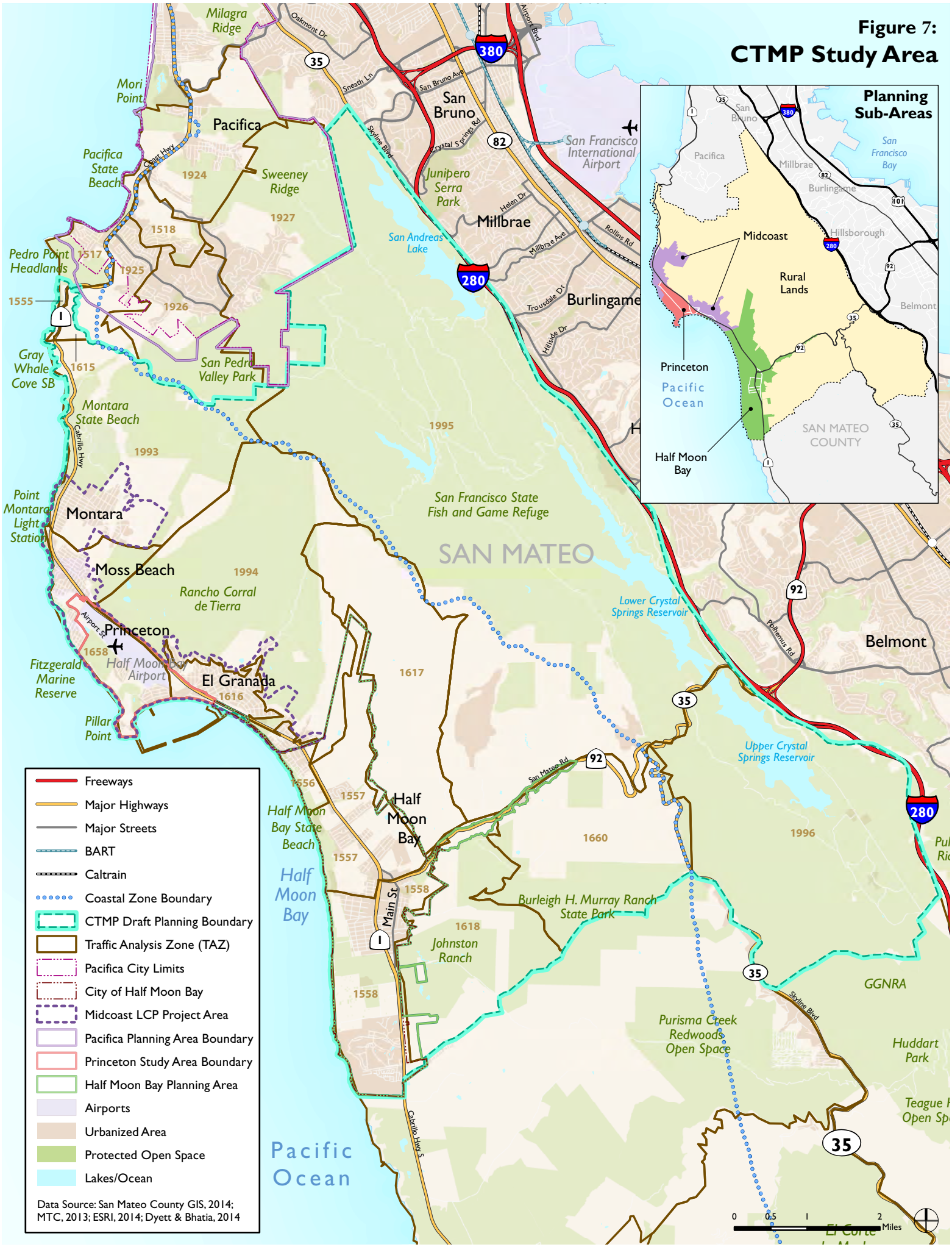
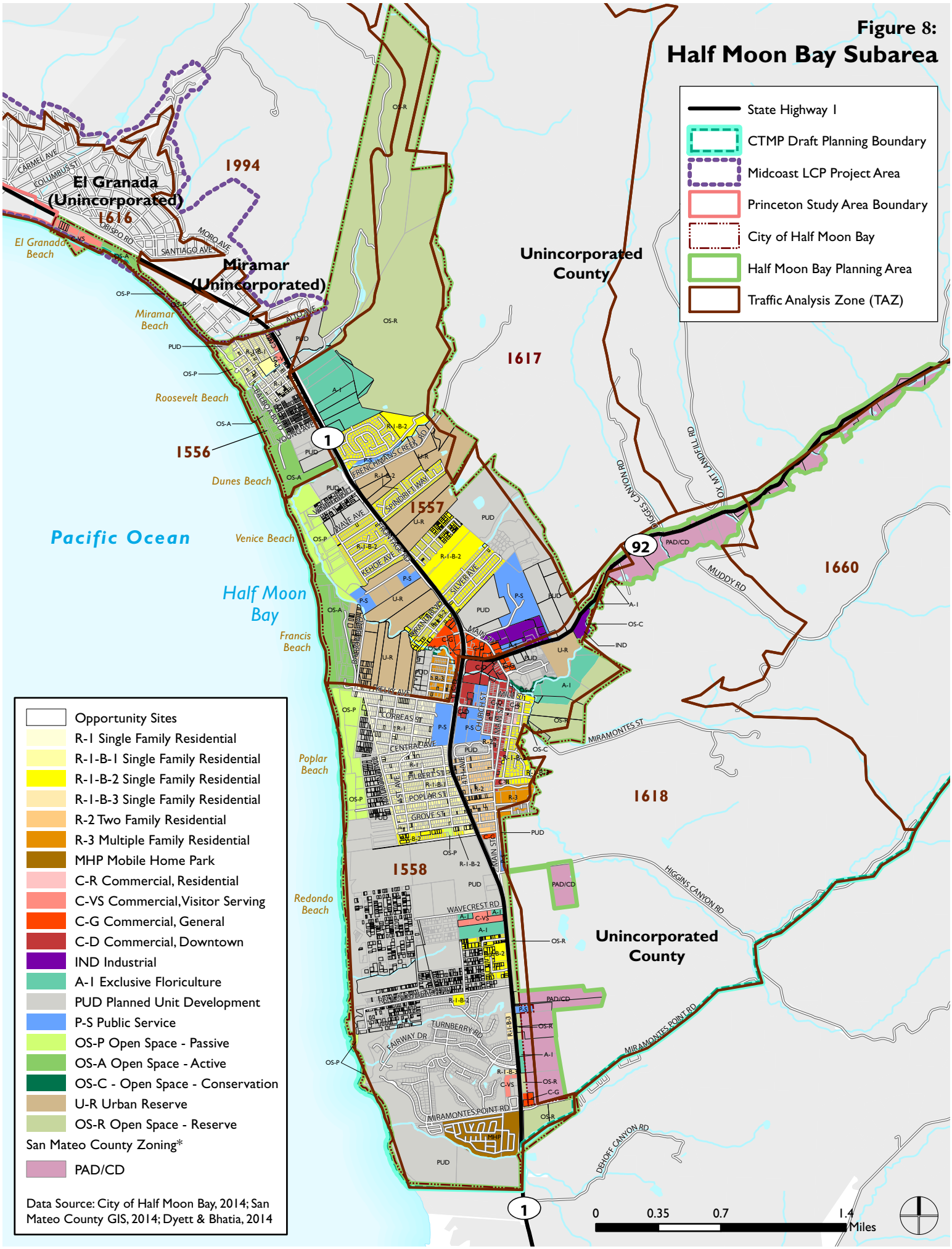


Figure 8:
Half Moon Bay Subarea



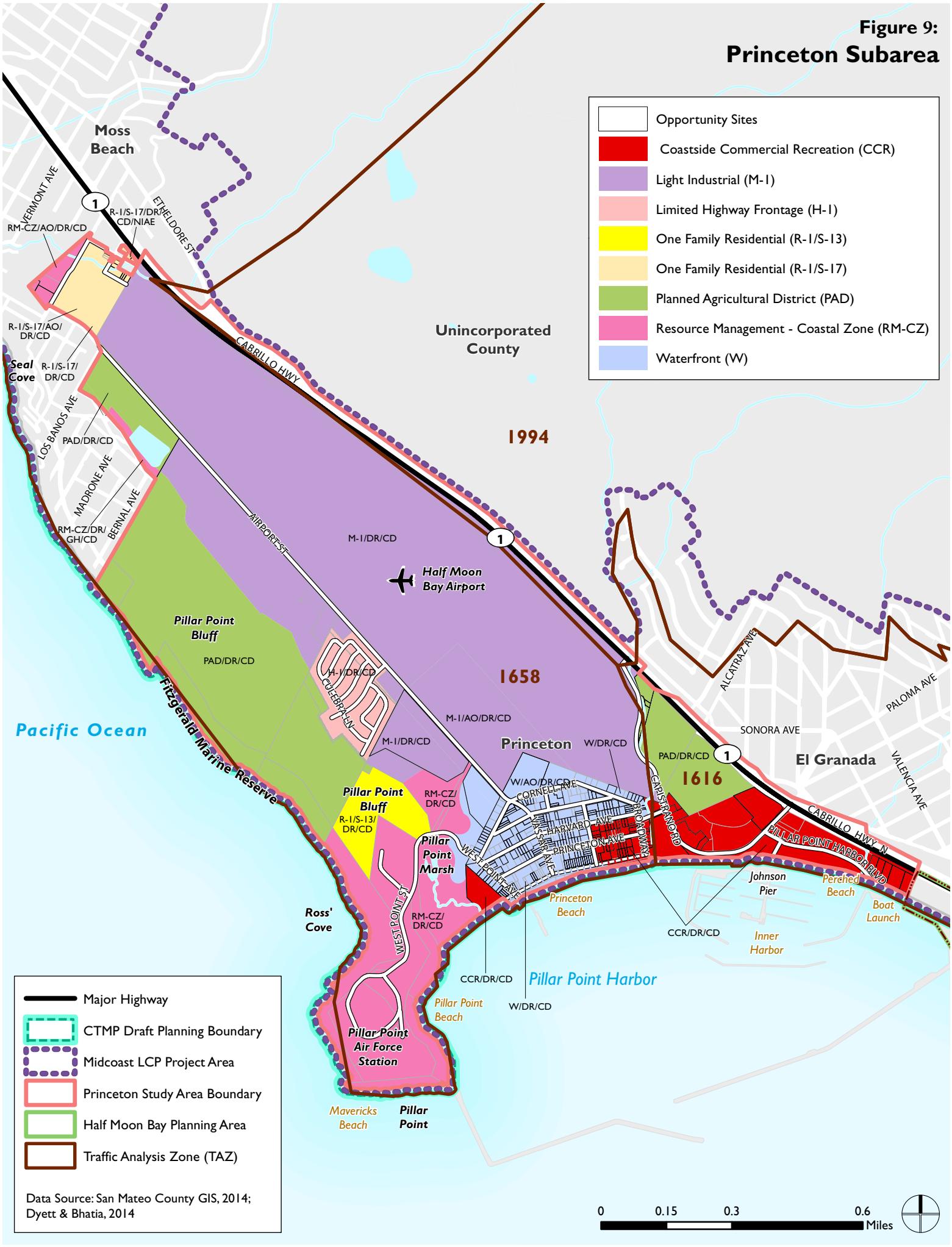
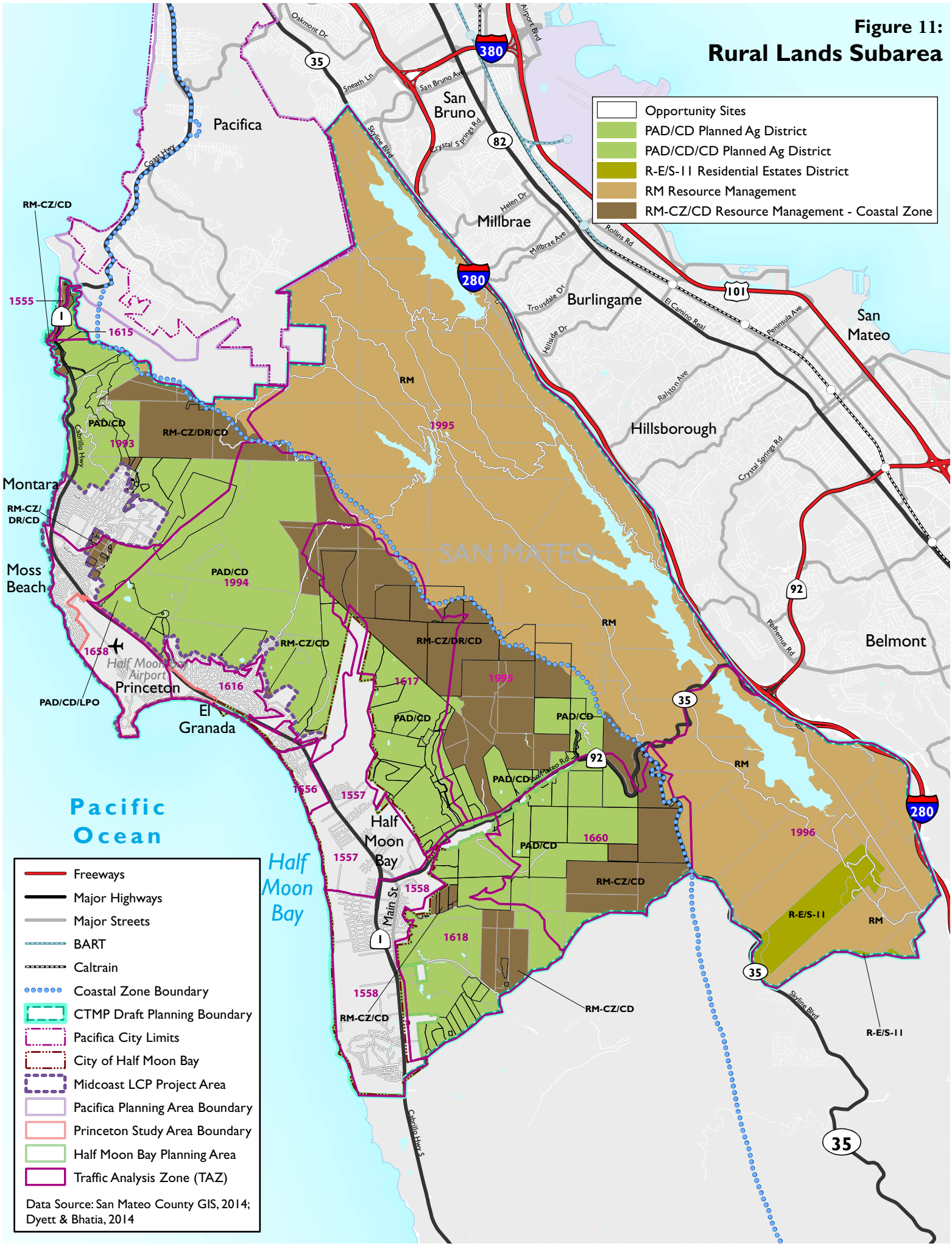


Figure 9:
Princeton Subarea
Opportunity Sites
Coastside Commercial Recreation (CCR)
Light Industrial (M-1)
Limited Highway Frontage (H-1)
One Family Residential (R-1/S-13)
One Family Residential (R-1/S-17)
Planned Agricultural District (PAD)
Resource Management - Coastal Zone (RM-CZ)
Waterfront (W)
Moss Beach
Unincorporated County
1994
1658
1616
Seal Cove
Half Moon Bay Airport
Pillar Point Bluff
Princeton
El Granada
Pacific Ocean
Fitzgerald Marine Reserve
Pillar Point Marsh
Ross' Cove
Pillar Point Harbor
Pillar Point Air Force Station
Mavericks Beach
Pillar Point
Princeton Beach
Pillar Point Beach
Johnson Pier
Perched Beach
Boat Launch
Inner Harbor
CABRILLO HWY
VERMONT AVE
ETHELDORE ST
LOS BANOS AVE
MADRONE AVE
BERNAL AVE
AIRPORT ST
CULEBRA LN
CORNELL AVE
HARVARD AVE
PRINCETON AVE
BROADWAY
CAPISTRANO RD
PILLAR POINT HARBOR BLVD
WEST POINT AVE
WEST POINT ST
ALCATRAZ AVE
SONORA AVE
PALOMA AVE
VALENCIA AVE
R-1/S-17/DR/CD/NIAE
RM-CZ/AO/DR/CD
R-1/S-17/AO/DR/CD
R-1/S-17/DR/CD
PAD/DR/CD
RM-CZ/DR/GH/CD
M-1/DR/CD
M-1/AO/DR/CD
W/DR/CD
W/AO/DR/CD
PAD/DR/CD
RM-CZ/DR/CD
R-1/S-13/DR/CD
CCR/DR/CD
W/DR/CD
Major Highway
CTMP Draft Planning Boundary
Midcoast LCP Project Area
Princeton Study Area Boundary
Half Moon Bay Planning Area
Traffic Analysis Zone (TAZ)
Data Source: San Mateo County GIS, 2014; Dyett & Bhatia, 2014
0
0.15
0.3
0.6
Miles


Figure 10:
Midcoast Subarea
Opportunity Sites
C-1 Neighborhood Business District
CCR Coastside Commercial Recreation District
COSC/DR/CD Community Open Space Conservation District
EG/DR (El Granada Gateway District)
H-1 Limited Highway Frontage
M-1 Light Industrial
P/DR; P/GH/CD Parking District
PAD/CD Planned Ag District
PUD Planned Unit Development
R-1 One Family Residential
R-3 Multiple-Family Residential District
R-E Residential Estates District
RM Resource Management
RM-CZ Resource Management - Coastal Zone
1993
RM-CZ/DR/CD
CCR/DR/CD
C-1/S-7/DR/CD
PAD/CD
Montara
C-1/S-3/DR/CD
COSC/LPO
PUD-120/DR/CD
R-1/S-17/DR/CD
CCR/DR/CD
RM-CZ/DR/CD
PAD/DR/CD
RM-CZ/DR/CD
COSC/DR/CD
PUD-124/CD
Moss Beach
1658
PAD/CD
1994
PUD-121/DR/CD
C-1/S-3/DR/CD
R-3-A/S-5/DR/CD
RM-CZ/DR/CD
RM-CZ/DR/CD
RM-CZ/DR/GH/CD
PAD/DR/CD
CCR/DR/GH/CD
P/GH/CD
R-1/S-17/DR/GH/CD
RM-CZ/DR/GH/CD
1
R-3-A/S-3/DR/CD
R-1/S-17/DR/CD
1658
Half Moon Bay Airport
El Granada
R-1/S-105/DR/GH/CD
Princeton
RM-CZ/DR/CD
1616
RM-CZ/CD
Pacific Ocean
C-1/S-3/DR/CD
RM-CZ/DR/CD
R-3/S-3/DR/CD
EG/DR
P/DR
R-1/S-94/DR/CD
CCR/DR/CD
R-1/S-17/DR/CD
1556
Major Highway
CTMP Draft Planning Boundary
City of Half Moon Bay
Midcoast LCP Project Area
Princeton Study Area Boundary
Half Moon Bay Planning Area
Traffic Analysis Zone (TAZ)
Data Source: San Mateo County GIS, 2014; Dyett & Bhatia, 2014
0
0.275
0.55
1.1
Miles

Figure 11:
Rural Lands Subarea



PRIOR BUILDOUT PROJECTIONS

Existing buildout projections from the San Mateo County Midcoast LCP Update, adopted in 2012, are provided in Table 6. These projections are compared with the buildout analysis conducted for the CTMP, for the Princeton and Midcoast subareas. As Table 6 shows, projected residential buildout for the CTMP falls within the range projected under the Midcoast LCP.

Table 6: San Mateo County LCP Buildout Estimate (2006)

	San Mateo County LCP Buildout Estimate (2006)		Midcoast CTMP Buildout Estimate for Princeton and Midcoast Subareas (2014)	
Zoning District	Existing and Permitted Units (2008)	Buildout Units	Existing and Pipeline Units (2014)	Buildout Units
R-1		4,804	3,641	4,882
R-3		443	154	256
R-3-A		513	0	715
RM-CZ and PAD		160	87	91
C-1 and CCR		99 - 495	42	117
Second Units		466		466
Caretakers' Quarters		45	29	127
Pillar Ridge Manufactured Home Community		227	227	227
EG			61	61
Total	**3,928**	**6,757 - 7,153**	**4,241**	**6,942**

Sources: San Mateo County Local Coastal Program Policies, 2013, Dyett & Bhatia, 2014.

The Association of Bay Area Governments (ABAG) 2013 projections for current (2010) and future (2040) jobs by job type, were reviewed for each of the subareas in the CTMP Study Area. The ABAG Projections are provided in Table 7. Table 8 shows the job projections that result from the current CTMP buildout analysis. A comparison of the two tables shows that the two projections result in a similar number of total existing and projected jobs for each subarea. ABAG estimates 5,030 jobs in Half Moon Bay for 2010, compared to 4,904 in the CTMP estimate of existing development. By 2040, ABAG estimates 6,020 jobs in Half Moon Bay, compared to the CTMP projection of 6,616. For the Midcoast, including Princeton and the unincorporated communities that comprise the CTMP's Midcoast subarea, ABAG and CTMP numbers are similarly close.

There are more sizable differences in the projections by job type. The projections here come out somewhat higher in the Manufacturing, Wholesale and Transportation category and the Retail category compared to the ABAG projections, while ABAG's numbers are higher in the Service-related categories.

Table 7: ABAG Jobs Projections (2013)

	Half Moon Bay		Unincorporated Midcoast		Total	
Jobs by Type	2010	2040	2010	2040	2010	2040
Agriculture & Natural Resources	390	320	-	-	390	320
Manufacturing, Wholesale & Transportation	470	520	300	200	770	720
Retail Jobs	650	690	100	100	750	790
Service and Other[1]	3,520	4,490	1,800	2,700	5,320	7,190
Total Jobs	5,030	6,020	2,200	3,000	7,230	9,020

Notes:
1 Three ABAG jobs categories - Financial and Professional Service Jobs; Health, Recreational and Educational Service Jobs; and Other Jobs - are combined here.

Source: ABAG Projections, 2013.

Table 8: CTMP Buildout Jobs Projections (2014)

	Half Moon Bay		Unincorporated Midcoast[1]		Total[2]	
Jobs by Type	Existing	Buildout	Existing	Buildout	Existing	Buildout
Agriculture & Natural Resources	357	335	71	75	428	410
Manufacturing, Wholesale & Transportation	244	452	401	698	645	1,150
Retail	848	1,138	426	660	1274	1,798
Service	3,455	4,691	1148	1,766	4603	6,457
Total Jobs	4,904	6,616	2,046	3,199	6950	9,815

Notes:
1 Unincorporated Midcoast is comprised of Princeton and Midcoast Subareas.
2 Also included in the projection is 82 jobs classified as Agriculture & Natural Resources for both Existing and Buildout Conditions for the rural area outside of Half Moon Bay and the Unincorporated Midcoast regions. This region has no corresponding region in the ABAG projection.

Source: ABAG Projections, 2013, Dyett & Bhatia, 2014.

BUILDOUT ANALYSIS

Residential Development

The buildout analysis finds a total of 8,373 existing housing units in the CTMP Study Area, including 7,090 single-family units and 1,283 multifamily units. At buildout, there is an estimated capacity for 12,352 units, including 9,691 single-family and 2,661 multifamily units. Table 9 and Table 10 break down the existing and buildout residential development by Subarea and by TAZ, respectively. This represents a 29% increase in residential units in Half Moon Bay and a 45% and 66% increase in residential units in Princeton and the Midcoast, respectively, with an overall 48% increase in residential units for the Study Area. The TAZ with the largest amount of growth is 1658 which includes the Moss Beach and Pillar Point areas with a 104% increase in residential units. There is also a very high percentage of growth for TAZs 1617, 1660, and 1995, but these are based on a very low number of residential units under Existing Conditions.

Table 9: Residential Development in CTMP Study Area by Subarea

	Existing			Buildout		
Subarea	*Total Units*	*Single-Family*	*Multifamily*	*Total Units*	*Single-Family*	*Multifamily*
Half Moon Bay	4,072	3,084	988	5,258	3,960	1,298
Princeton	264	251	13	384	260	124
Midcoast	3,961	3,679	282	6,558	5,319	1,240
Rural Lands	76	76	0	152	152	0
Total (% growth)	**8,373**	**7,090**	**1,283**	**12,352 (48%)**	**9,691 (37%)**	**2,661 107%)**

Table 10: Residential Development in CTMP Study Area by TAZ

TAZ	Location	Existing			Buildout		
		Total Units	*Single-Family*	*Multifamily*	*Total Units (% growth)*	*Single-Family*	*Multifamily*
1555	Devil Slide Coast	0	0	0	0 (+0)	0	0
1556	Miramar	212	205	7	358 (+146)	350	8
1557	North Half Moon Bay	1,221	962	259	1,876 (+655)	1,540	335
1558	South Half Moon Bay	2,555	1,833	722	3,211 (+656)	2,254	956
1615	Devils Slide Tunnel	0	0	0	1 (+1)	1	0
1616	El Granada	1,665	1,432	233	2,387 (+722)	2,028	359
1617	Rural North of SR 92	4	4	0	25 (+21)	25	0
1618	Rural South of SR 92	87	87	0	109 (+22)	109	0
1658	Moss Beach/Pillar Point	1,076	1,048	28	2,193 (+1,117)	1,422	770
1660	Rural South of SR 92	14	14	0	29 (+15)	29	0
1993	Montara	1,067	1,033	34	1,525 (+458)	1,394	131
1994	Rural East of El Granada	456	456	0	898 (+442)	793	105
1995	Rural North of SR 92	6	6	0	24 (+18)	24	0
1996	Rural South of SR 92	10	10	0	10 (+0)	10	0
Total (% growth)		**8,373**	**7,090**	**1,283**	**12,352 (48%)**	**9,691**	**2,661**

Note: "Total Units" figures have been rounded.

Non-Residential Development

The buildout analysis finds a total of approximately 5.8 million square feet of existing non-residential development, supporting an estimated 7,032 jobs. At buildout, there is an estimated capacity for 8.5 million square feet of non-residential development and 9,897 jobs. Of these jobs, 6,457 are projected to be in service categories, 1,798 in retail, and the remainder in manufacturing, wholesale, agriculture and natural resources. Table 11 and Table 12 break down existing and buildout non-residential development by Subarea. Table 13 and Table 14 break down existing and buildout non-residential development TAZ. This represents a 35% increase in total jobs in Half Moon Bay and a 56% increase in jobs in Princeton and the Midcoast, with an overall 41% increase in total jobs for the Study Area. The largest growth occurs in manufacturing jobs with 81% growth and wholesale & trade with 75% growth. Both of these industries only occur in the Half Moon Bay and Princeton areas. The TAZs with the largest amount of growth are 1558 and 1658 which includes south Half Moon Bay and the rural area just east of Half Moon Bay. The TAZs with the greatest percent growth in jobs with a 77% increase in total jobs is projected to be the Moss Beach/Pillar Point area.

Table 11: Non-Residential Development and Jobs in CTMP Study Area by Subarea - Existing

Subarea	Non-Residential Sq. Ft.	Total Jobs	Retail	Services	Agricultural & Natural Resources	Manufacturing	Wholesale & Trade
Half Moon Bay	3,668,093	4,904	848	3,455	357	84	161
Princeton	1,205,000	1,112	138	551	24	267	134
Midcoast	958,200	933	289	597	47	-	-
Rural Lands	-	82	-	-	82	-	-
Total	**5,831,293**	**7,032**	**1,274**	**4,603**	**510**	**351**	**294**

Table 12: Non-Residential Development and Jobs in CTMP Study Area by Subarea - Total Buildout

Subarea	Non-Residential Sq. Ft.	Total Jobs	Retail	Services	Agricultural & Natural Resources	Manufacturing	Wholesale & Trade
Half Moon Bay	5,097,000	6,616	1,138	4,691	335	155	297
Princeton	2,276,000	1,987	249	1,015	25	481	217
Midcoast	1,161,100	1,212	411	718	50	-	-
Rural Lands	-	82	-	-	82	-	-
Total (% growth)	**8,533,906 (46%)**	**9,897 (41%)**	**1,798 (41%)**	**6,457 (40%)**	**492 (-4%)**	**636 (81%)**	**514 (75%)**

Table 13: Non-Residential Development and Jobs in CTMP Study Area by TAZ - Existing

TAZ	Location	Non-Residential Sq. Ft.	Total Jobs	Retail	Services	Agricultural & Natural Resources	Manufacturing	Wholesale & Trade
1555	Devil Slide Coast	0	0	0	0	0	0	0
1556	Miramar	76,079	117	6	96	15	0	0
1557	North Half Moon Bay	1,119,593	1,976	557	1,250	140	10	20
1558	South Half Moon Bay	2,259,568	2,535	257	2,014	150	39	76
1615	Devils Slide Tunnel	0	0	0	0	0	0	0
1616	El Granada	754,267	789	217	568	5	0	0
1617	Rural North of SR 92	0	9	0	0	9	0	0
1618	Rural South of SR 92	26,060	96	12	31	53	0	0
1658	Moss Beach/Pillar Point	1,167,200	1,048	145	464	39	267	134
1660	Rural South of SR 92	119,225	123	0	0	23	34	65
1993	Montara	227,600	246	81	153	11	0	0
1994	Rural East of El Granada	81,700	86	0	27	59	0	0
1995	Rural North of SR 92	0	6	0	0	6	0	0
1996	Rural South of SR 92	0	0	0	0	0	0	0
Total		**5,831,293**	**7,032**	**1,274**	**4,603**	**510**	**351**	**294**

Table 14: Non-Residential Development and Jobs in CTMP Study Area by TAZ - Total Buildout

TAZ	Location	Non-Residential Sq. Ft.	Total Jobs (growth)	Retail	Services	Agricultural & Natural Resources	Manufacturing	Wholesale & Trade
1555	Devil Slide Coast	0	0 (+0)	0	0	0	0	0
1556	Miramar	98,682	140 (+23)	9	115	15	0	0
1557	North Half Moon Bay	1,407,307	2,273 (+297)	577	1,360	140	67	129
1558	South Half Moon Bay	3,298,654	3,839 (+1,304)	511	3,050	127	52	99
1615	Devils Slide Tunnel	0	0 (+0)	0	0	0	0	0
1616	El Granada	1,128,645	1,172 (+383)	321	846	5	0	0
1617	Rural North of SR 92	0	9 (+9)	0	0	9	0	0
1618	Rural South of SR 92	90,094	170 (+74)	23	89	53	2	4
1658	Moss Beach Pillar Point	2,028,300	1,759 (+711)	245	744	40	481	217
1660	Rural South of SR 92	119,225	123 (+0)	0	0	23	34	65
1993	Montara	281,300	320 (+74)	112	194	14	0	0
1994	Rural East of El Granada	81,700	86 (+0)	0	27	59	0	0
1995	Rural North of SR 92	-	6 (+0)	0	0	6	0	0
1996	Rural South of SR 92	0	0 (+0)	0	0	0	0	0
Total (% growth)		**8,533,906 (46%)**	**9,897 (41%)**	**1,798 (41%)**	**6,457 (40%)**	**492 (-4%)**	**636 (81%)**	**514 (75%)**

CAPACITY OF WATER AND WASTEWATER SYSTEMS

Water and sewer capacity are critical infrastructure needed to support existing and future development in the Midcoast Study Area. Both the Midcoast LCP (2013) and the City of Half Moon Bay LCP (1993) have policies that explicitly reserve water and sewer capacity for priority land uses defined by the Coastal Act and the respective LCPs. A summary of the existing infrastructure, capacity, and demand of the potable water and sanitary systems is provided in Appendix C.

TRAVEL FORECAST AND BUILDOUT LEVEL OF SERVICE

FORECAST METHODOLOGY AND RESULTS

The traffic operational analysis conducted for this effort required forecasts of future year demands for the study intersections. These forecasts of future traffic demands were developed using the San Mateo County C/CAG-VTA travel demand model, but involved several steps. This process can be summarized as follow:

1. Run travel demand model for current year and the horizon year (2040).
2. Compute change ("growth") in demand for each link within the study network. Links include intersection approach and departure links.
3. Compute future year link demands by adding "growth" to existing (observed) demands.
4. Compute future year intersection turn movement volumes using Furness process. Inputs to this process include existing turn movement volumes and future year approach and departure link volumes.

Because the San Mateo County travel model only generates trips at TAZ centroid, the Furness process added generated volumes to relevant intersections along the corridor based on land use. As there is no Weekend Model, the Weekend Midday forecast was developed by determining a standard factor to convert 6-hour Weekday Midday model volumes into Weekend Midday peak hour volumes. This was done by using 7-day tube counts along Highway 1 and SR 92 to calculate midweek[9] 6-hour Midday volumes and Saturday Midday peak hour volumes. The average ratio was found to be 16.4% and was used to determine Buildout Condition Midday peak hour volumes for the Furness process.

While the Buildout analysis shows a 51% increase in residential units and a 42% increase in total jobs, the volumes show a growth of 10%-50% along Highway 1 and 15%-35% along SR 92 in the study area during the commuter peak hours. This represents 10%-35% of the Buildout Condition volumes along Highway 1 and 15%-25% along SR 92 during the commuter peak hours. Traffic volumes from Study Area TAZs show a 33% increase under Buildout Conditions.

TRANSPORTATION GAPS AND DEFICIENCIES IN BUILDOUT

There are two ways growth under Buildout Conditions affects transportation conditions within the study area. Development within the Study Area increases the number of vehicles wanting to turn on Highway 1 and SR 92 from arterials and collector streets within the Study Area. This growth is spread along multiple access points, but can result in increased delay at intersections along Highway 1 and SR 92, most of which only have a single lane of access and are controlled by minor-street stop signs. While development within the Study Area also results in an increase in traffic volumes along Highway 1, some growth is also due to regional pass-through trips which do not originate or terminate within the Study Area.

[9] Tuesday, Wednesday, Thursday

A comparison of intersection LOS between Existing Conditions and Buildout (2040) Conditions is provided for Weekday AM and PM peak hour and Weekend peak recreational hour in Table 15. A comparison of roadway segment LOS is given in.

Midcoast

Intersection LOS

The *San Mateo County Traffic Impact Study Requirements* defines the intersection LOS standard for San Mateo County as LOS C with no individual movement operating at worse than LOS D. There is no definition of peak periods, however it is noted that a standard of LOS D during a peak period may be allowed for dense urban conditions per County's discretion. No differentiation is made between signalized and unsignalized intersections besides the LOS standard defined for individual movements.

The policy defined by the LCP in assessing the need for road expansion has LOS D as the desired level of service for segments during commuter peak periods, except during recreation peak periods when LOS E is acceptable. The LCP has an intersection standard of LOS D.

Under Buildout Conditions the signalized intersection of Highway 1 & Coronado Street will operates at LOS D during the AM peak hour and LOS E during the PM peak hour, which is below the standard. The other signalized intersections within the Midcoast region operate above the LOS C standard. The majority of unsignalized intersections along Highway 1 have minor street approaches that operate below the LOS D standard. The following intersections do not meet the LOS standard during the listed peak hours:

- Highway 1 and 2nd Street (AM, PM, Midday)
- Highway 1 and 8th Street (AM, PM, Midday)
- Highway 1 and Vallemar Street (PM, Midday)
- Highway 1 and California Avenue (AM, PM, Midday)
- Highway 1 and Virginia Avenue (AM, PM, Midday)
- Highway 1 and Vermont Avenue (AM, PM, Midday)
- Highway 1 and Cypress Avenue (AM, PM, Midday)
- Highway 1 and St. Etheldore Street (AM, PM)
- Highway 1 and Coral Reef Avenue (AM, PM, Midday)
- Highway 1 and Magellan Avenue (AM, PM, Midday)
- Highway 1 and Medio Avenue (AM, PM, Midday)
- Highway 1 and Miramar Drive (AM, PM, Midday)

All of the unsignalized intersections that will operate below the standard are minor-street stop-controlled and only have one lane of approach. Of these intersections, 2nd Street, 8th Street, California Avenue and Cypress Avenue have more than 75 vehicles per hour on an approach turning onto Highway 1 and satisfy the peak hour signal warrant. While adding additional approach lanes may facilitate the movement of right-turning vehicles onto Highway 1, the main source of the failing LOS for these locations is the high through volume along Highway 1. This results in left-turning vehicles on the minor street needing to wait a long time for a sufficient gap between cars to safely complete the maneuver. This could be mitigated by signalizing intersections with high minor street volumes and combining low volume minor street approaches into a signalized intersection.

Roadway Segment LOS

The CMP provides LOS standards for peak commuting hours for roadway segments designated to be in the CMP Roadway System. Roadway segments along Highway 1 within the Study Area have a LOS E standard. However, the policy defined by the LCP in assessing the need for road expansion has LOS D as the desired level of service for segments during commuter peak periods, except during recreation peak periods when LOS E is acceptable. Highway 1 between Coronado Street and Miramar Drive operates below the CMP standard at LOS F. While the remainder of the roadways segments within the Study Area operate above the LOS E standard given in the CMP, Highway 1 along the entire Midcoast region between 1st Street and Miramar Drive does not meet the LCP LOS D standard during the listed peak hours.

Half Moon Bay

Intersection LOS

The CMP intersections of Highway 1/SR 92 and Main Street/SR 92 are the only CMP intersections within the Study Area. The Highway 1 and SR 92 intersection has a CMP LOS standard of 'E' and the intersection of Main Street/SR 92 has a CMP LOS standard of 'F'. The intersection of Highway 1/SR 92 operates below the standard at LOS F during the Midday peak hour. While the intersection of Main Street/SR 92 operates within the CMP standard, it does not meet the LCP standard.

The City of Half Moon Bay has a standard of LOS C for intersections along Highway 1 and SR 92, except during the peak two-hour commuting period on weekdays and the ten-day peak recreational hour[10] on weekends when LOS E is acceptable. No standards are defined for intersections not along Highway 1 and SR 92. No differentiation is made between signalized and unsignalized intersections.

Under Buildout Conditions the following non-CMP signalized intersections will not meet the LOS standard during the listed peak hours:

- Highway 1 and Ruisseau Francais Avenue (Midday)
- Highway 1 and Main Street (north) (PM, Midday)
- Highway 1 and Kelly Avenue (Midday)

All other non-CMP signalized intersections within the City of Half Moon Bay will operate above the LOS E standard; however several of the unsignalized intersections along Highway 1 and Main Street will operate below the standard. The following intersections will not meet the LOS standard during the listed peak hours:

- Highway 1 and Mirada Road (AM, PM, Midday)
- Highway 1 and Roosevelt Boulevard (AM, PM, Midday)
- Highway 1 and Young Avenue (AM, PM, Midday)
- Highway 1 and Frenchman's Creek Road (AM, PM, Midday)
- Highway 1 and Venice Boulevard (AM, PM, Midday)
- Highway 1 and Spindrift Way (AM, PM, Midday)
- Highway 1 and Kehoe Avenue (AM, PM, Midday)
- Highway 1 and Grandview Boulevard (AM, PM, Midday)
- Highway 1 and Belleview Boulevard (AM)
- Highway 1 and Filbert Street (AM, PM, Midday)

[10] For the purpose of this report, the ten-day peak recreational hour is referred to as the Midday peak hour

- Highway 1 and Seymour Street (AM, PM, Midday)
- Main Street and Lewis Foster Drive (PM)

All of the unsignalized intersections that operate below the standard are minor-street stop-controlled and only have one lane of approach. Of these intersections, Spindrift Way, Kehoe Avenue, Grandview Avenue, Filbert Street and Seymour Street have more than 75 vehicles per hour on an approach turning onto Highway 1 and satisfy the peak hour signal warrant. While adding additional approach lanes may facilitate the movement of right-turning vehicles onto Highway 1, the main source of the failing LOS for these locations is the high through volume along Highway 1. This results in left-turning vehicles on the minor street needing to wait a long time for a sufficient gap between cars to safely complete the maneuver. This could be mitigated by signalizing intersections with high minor street volumes and combining low volume minor street approaches into a signalized intersection.

East of Half Moon Bay, the following study intersections operate at LOS F:

- SR 92 and Muddy Road/Ox Mountain Landfill Road (PM, Midday)
- SR 92 and Skyline Boulevard (AM, PM, Midday)
- SR 92 and SR 35 (PM, Midday)

Muddy Road and Ox Mountain Landfill Road will have very low volumes entering SR 92. Skyline Boulevard and SR 35 will have enough vehicles entering SR 92 to satisfy the peak hour signal warrant.

Roadway Segment LOS

The CMP provides LOS standards for peak commuting hours for roadway segments designated to be in the CMP Roadway System. Roadway segments along Highway 1 and SR 92 within the Study Area have a LOS E standard. However, the policy defined by the LCP in assessing the need for road expansion has LOS D as the desired level of service for segments during commuter peak periods, except during recreation peak periods when LOS E is acceptable. The following roadways segments within the Study Area operate below the LOS standard given in the CMP:

- Highway 1 between Miramar Drive and Roosevelt Boulevard (Midday)
- Highway 1 between Roosevelt Boulevard and Young Avenue (PM, Midday)
- Highway 1 from Young Avenue to Ruisseau Francais Avenue (Midday)
- Highway 1 from Ruisseau Francais Avenue to Venice Boulevard (PM, Midday)
- Highway 1 from Venice Boulevard to Frontage Road (Midday)
- Highway 1 between Frontage Road to Spindrift Way (PM, Midday)
- Highway 1 from Spindrift Way to Kehoe Avenue (Midday)
- Highway 1 from Kehoe Avenue to Grandview Boulevard (AM, PM, Midday)
- SR 92 from Skyline Boulevard to SR 35 (PM, Midday)

Additionally, several roadway segments fall below the stricter standard provided by the LCP. The following roadway segments do not meet the LCP LOS D standard during the listed peak hours:

- Highway 1 between Miramar Drive and Grandview Boulevard (AM, PM, Midday)
- Highway 1 between Kelly Avenue and Seymour Street (AM, PM)
- Highway 1 between Redondo Beach Road and Fairway Drive (AM, PM)
- SR 92 from Main Street to Skyline Boulevard (AM, PM)
- SR 92 from Skyline Boulevard to SR 35 (AM, PM, Midday)
- SR 92 between SR 35 and I-280 (AM, PM)

Table 15: Buildout (2040) Conditions Peak Hour Intersection Level of Service

Intersection Number	LOS Standard[1]	Street Names	Control Type	AM Peak Hour		PM Peak Hour		Midday Peak Hour	
				Existing[2]	Buildout[2]	Existing[2]	Buildout[2]	Existing[2]	Buildout[2]
1	C(D)	SR-1 / 2nd St	TWSC	C	**F**	C	**F**	C	**F**
2	C(D)	SR-1 / 7th St	TWSC	B	C	B	C	B	C
3	C(D)	SR-1 / 8th St	TWSC	C	**F**	D	**F**	**E**	**F**
4	C(D)	SR -1 / Carlos St	TWSC	B	C	B	C	B	C
5	C(D)	SR-1 / Vallemar St	TWSC	C	D	C	**F**	C	**E**
6	C(D)	SR-1 / California Ave	TWSC	D	**F**	**E**	**F**	**F**	**F**
7	C(D)	SR-1 / Virginia Ave	TWSC	C	**F**	**E**	**F**	**F**	**F**
8	C(D)	SR-1 / Vermont Ave (WB)	TWSC	D	**F**	**E**	**F**	**F**	**F**
9	C(D)	SR-1 / Cypress Ave (EB)	TWSC	**E**	**F**	**F**	**F**	**F**	**F**
10	C(D)	SR-1 / St Etheldore St	TWSC	C	**F**	D	**F**	**E**	C
11	C(D)	SR-1 / Capistrano Rd (North)	TWSC	C	C	C	C	D	D
12	C(D)	SR-1 / Coral Reef Ave	TWSC	C	**F**	C	**F**	D	**F**
13	C(D)	SR-1 / Capistrano Rd (South)	Signalized	B	C	B	C	C	C
14	C(D)	SR-1 / Coronado St	Signalized	C	**D**	B	C	B	**E**
15	C(D)	Obispo Rd / Coronado St	TWSC	B	B	B	B	B	B
16	C(D)	SR-1 / Magellan Ave	TWSC	**F**	**F**	**F**	**F**	**F**	**F**
17	C(D)	SR-1 / Medio Ave	TWSC	**F**	**F**	**F**	**F**	**F**	**F**
18	C(D)	SR-1 / Miramar Dr	TWSC	C	**E**	**F**	**F**	E	**F**
19	E	SR-1 / Mirada Rd	TWSC	**F**	**F**	**F**	**F**	**F**	**F**

Intersection Number	LOS Standard[1]	Street Names	Control Type	AM Peak Hour		PM Peak Hour		Midday Peak Hour	
				Existing[2]	Buildout[2]	Existing[2]	Buildout[2]	Existing[2]	Buildout[2]
20	E	SR-1 / Roosevelt Blvd (North)	TWSC	E	**F**	D	**F**	**F**	**F**
22	E	SR-1 / Young Ave	TWSC	**F**	**F**	E	**F**	**F**	**F**
23	E	SR-1 / Ruisseau Francais	Signalized	A	E	A	C	C	**F**
24	E	SR-1 / Frenchmans Creek Rd	TWSC	**F**	**F**	**F**	**F**	**F**	**F**
25	E	SR-1 / Venice Blvd	TWSC	**F**	**F**	**F**	**F**	**F**	**F**
26	E	SR-1 / Spindrift Wy	TWSC	**F**	**F**	**F**	**F**	**F**	**F**
27	E	SR-1 / Kehoe Ave	TWSC	E	**F**	E	**F**	**F**	**F**
28	E	SR-1 / Grandview Blvd	TWSC	**F**	**F**	**F**	**F**	**F**	**F**
29	E	SR-1 / Terrace Ave/Grand Blvd[3]	Signalized	**F**	B	**F**	A	**F**	A
30	E	SR-1 / Grand Blvd	Removed	E		D		E	
31	E	SR-1 / Belleville Blvd	TWSC	D	**F**	D	E	B	C
32	E	SR-1 / N. Main St	Signalized	D	D	**F**	**F**	D	**F**
33	E	SR-1 / SR-92	Signalized	C	C	C	D	E	**F**
34	E	SR-1 / Kelly Ave	Signalized	D	D	D	D	D	**F**
35	E	SR-1 / Filbert St	TWSC	**F**	**F**	**F**	**F**	**F**	**F**
36	E	SR-1 / Poplar St	Signalized	B	D	A	D	C	F
37	E	SR-1 / Seymour St	TWSC	D	**F**	C	**F**	**F**	**F**
38	E	SR-1 / Higgins Canyon Rd/ Main St[3]	Signalized	C	A	C	A	E	A
39	E	SR-1 / Fairway Dr	Signalized	A	A	A	A	B	D

Intersection Number	LOS Standard[1]	Street Names	Control Type	AM Peak Hour		PM Peak Hour		Midday Peak Hour	
				Existing[2]	Buildout[2]	Existing[2]	Buildout[2]	Existing[2]	Buildout[2]
40	E	SR-1 / Miramontes Point Rd	Signalized	B	B	**B**	B	C	C
41	D	Main St / Lewis Foster Dr	TWSC	B	C	**C**	**E**	C	D
42	F	Main St / SR-92	Signalized	C	D	**C**	C	**F**	**F**
43	D	Main St / Kelly St	AWSC	A	A	**A**	B	B	B
44	D	Main St / Poplar St	TWSC	B	C	**B**	B	B	B
45	D	Main St / Seymour St	AWSC	A	A	**A**	A	A	A
46	C(D)	SR-92 / Muddy Rd	TWSC	**F**	E	**F**	**F**	D	**F**
47	C(D)	SR-92 / Skyline Blvd (West)	TWSC	E	**F**	**F**	**F**	**F**	**F**
48	C(D)	SR-92 / SR-35 (East)	Signalized	B	D	**C**	**F**	D	**F**

[1] Standards provided within parenthesis are for individual movements.

[2] Signalized intersections and all-way stop controlled (AWSC) intersections are reported by the average delay and LOS for the intersection; two-way stop controlled (TWSC) intersections are reported with the worst approach's delay and LOS. **Bolded** intersections fall below the defined LOS standard.

[3]Signalized as part of buildout conditions

Table 16: Buildout (2040) Conditions Peak Hour Roadway Segment Level of Service

Roadway Segment Number	Class	Location	Capacity	Buildout Condition								
				AM			PM			Sat Midday		
				Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]
1	Two-Lane Highway	Hwy 1 between 1st St and 2nd St	2800	**1867**	**0.67**	**E**	**2162**	**0.77**	**E**	2421	0.86	E
2	Two-Lane Highway	Hwy 1 between 2nd St and 7th St	2800	**1688**	**0.60**	**E**	**1940**	**0.69**	**E**	2265	0.81	E
3	Two-Lane Highway	Hwy 1 between 7th St and 9th St	2800	**1737**	**0.62**	**E**	**2019**	**0.72**	**E**	2297	0.82	E
4	Two-Lane Highway	Hwy 1 between 9th St and Carlos St	2800	**1886**	**0.67**	**E**	**2154**	**0.77**	**E**	2397	0.86	E
5	Two-Lane Highway	Hwy 1 between Carlos St and Vallemar St	2800	**1876**	**0.67**	**E**	**2151**	**0.77**	**E**	2396	0.86	E
6	Two-Lane Highway	Hwy 1 between Vallemar St and California St	2800	**1800**	**0.64**	**E**	**2068**	**0.74**	**E**	2323	0.83	E
6	Two-Lane Highway	Hwy 1 between California St and Vermont St	2800	**1873**	**0.67**	**E**	**2166**	**0.77**	**E**	2428	0.87	E
7	Two-Lane Highway	Hwy 1 between Vermont St and Cypress Ave	2800	**1956**	**0.70**	**E**	**2178**	**0.78**	**E**	2388	0.85	E
8	Two-Lane Highway	Hwy 1 between Cypress Ave and St. Etheldore St	2800	**1871**	**0.67**	**E**	**2136**	**0.76**	**E**	2428	0.87	E
9	Two-Lane Highway	Hwy 1 between St. Etheldore St and Capistrano Rd N	2800	**1646**	**0.59**	**E**	**1933**	**0.69**	**E**	2200	0.79	E
10	Two-Lane Highway	Hwy 1 between Capistrano Rd N and Coral Reef Ave	2800	**1605**	**0.57**	**E**	**1921**	**0.69**	**E**	2223	0.79	E

Roadway Segment Number	Class	Location	Capacity	Buildout Condition								
				AM			PM			Sat Midday		
				Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]
11	Two-Lane Highway	Hwy 1 between Coral Reef Ave and Capistrano Rd S	2800	**1598**	**0.57**	**E**	**2170**	**0.78**	**E**	2059	0.74	E
12	Two-Lane Highway	Hwy 1 between Capistrano Rd S and Coronado St	2800	**1835**	**0.66**	**E**	**2244**	**0.80**	**E**	2291	0.82	E
13	Two-Lane Highway	Hwy 1 between Coronado St and Medio Ave	2800	**2505**	**0.89**	**E**	**2897**	**1.03**	**F**	**2925**	**1.04**	**F**
14	Two-Lane Highway	Hwy 1 between Medio Ave and Miramar Dr	2800	**2559**	**0.91**	**E**	**2955**	**1.06**	**F**	**2962**	**1.06**	**F**
15	Two-Lane Highway	Hwy 1 between Miramar Dr and Mirada Rd	2800	**2596**	**0.93**	**E**	**2743**	**0.98**	**E**	**3190**	**1.14**	**F**
16	Two-Lane Highway	Hwy 1 between Mirada Rd and Guerrero St	2800	**2636**	**0.94**	**E**	**2768**	**0.99**	**E**	**3227**	**1.15**	**F**
17	Two-Lane Highway	Hwy 1 between Guerrero St and Roosevelt Blvd	2800	**2571**	**0.92**	**E**	**2723**	**0.97**	**E**	**3114**	**1.11**	**F**
18	Two-Lane Highway	Hwy 1 between Roosevelt Blvd and Young Ave	2800	**2615**	**0.93**	**E**	**2821**	**1.01**	**F**	**3331**	**1.19**	**F**
19	Two-Lane Highway	Hwy 1 between Young Ave and Ruisseau Francais Ave	2800	**2601**	**0.93**	**E**	**2789**	**1.00**	**E**	**3270**	**1.17**	**F**
20	Two-Lane Highway	Hwy 1 between Ruisseau Francais Ave and Frenchmans Creek Rd	2800	**2659**	**0.95**	**E**	**2858**	**1.02**	**F**	**3391**	**1.21**	**F**
21	Two-Lane Highway	Hwy 1 between Frenchmans Creek Rd and Venice Blvd	2800	**2723**	**0.97**	**E**	**2839**	**1.01**	**F**	**3206**	**1.15**	**F**
22	Two-Lane Highway	Hwy 1 between Venice Blvd and Frontage Rd	2800	**2561**	**0.91**	**E**	**2679**	**0.96**	**E**	**3059**	**1.09**	**F**

Roadway Segment Number	Class	Location	Capacity	Buildout Condition								
				AM			PM			Sat Midday		
				Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]
23	Two-Lane Highway	Hwy 1 between Frontage Rd and Spindrift Wy	2800	**2655**	**0.95**	**E**	**2884**	**1.03**	**F**	**3108**	**1.11**	**F**
24	Two-Lane Highway	Hwy 1 between Spindrift Wy and Kehoe Ave	2800	**2685**	**0.96**	**E**	**2798**	**1.00**	**E**	**3079**	**1.10**	**F**
25	Two-Lane Highway	Hwy 1 between Kehoe Ave and Grandview Blvd	2800	**2801**	**1.00**	**F**	**2888**	**1.03**	**F**	**3361**	**1.20**	**F**
26	Multi-Lane Highway	Hwy 1 From Grandview Blvd to Terrace Ave	4400	2007	0.46	D	1571	0.36	D	1871	0.43	D
	Multi-Lane Highway	Hwy 1 From Terrage to Grandview Blvd	4400	690	0.16	A	1284	0.29	A	1331	0.30	B
27	Multi-Lane Highway	Hwy 1 From Terrace Ave to Silver Ave	4400	2108	0.48	B	1617	0.37	B	1847	0.42	B
	Multi-Lane Highway	Hwy 1 From Silver Ave to Terrace Ave	4400	749	0.17	C	1383	0.31	C	1437	0.33	D
28	Multi-Lane Highway	Hwy 1 From Silver Ave to Belleville Blvd	4400	2063	0.47	B	1677	0.38	B	1921	0.44	B
	Multi-Lane Highway	Hwy 1 From Belleville Blvd to Silver Ave	4400	723	0.16	A	1380	0.31	B	1337	0.30	B
29	Multi-Lane Highway	Hwy 1 From Belleville Blvd to North Main St	4400	2145	0.49	B	1686	0.38	B	1848	0.42	B
	Multi-Lane Highway	Hwy 1 From North Main St to Belleville Blvd	4400	811	0.18	A	1367	0.31	B	1382	0.31	B
30	Multi-Lane Highway	Hwy 1 From North Main St to SR 92	4400	1704	0.39	B	1280	0.29	A	1376	0.31	B

Roadway Segment Number	Class	Location	Capacity	Buildout Condition								
				AM			PM			Sat Midday		
				Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]
	Multi-Lane Highway	Hwy 1 From SR 92 to North Main St	4400	688	0.16	A	920	0.21	A	947	0.22	A
31	Multi-Lane Highway	Hwy 1 From SR 92 to Pine Ave	4400	1686	0.38	B	1853	0.42	B	1847	0.42	B
	Multi-Lane Highway	Hwy 1 From Pine Ave to SR 92	4400	1111	0.25	A	1196	0.27	A	1145	0.26	A
32	Multi-Lane Highway	Hwy 1 From Pine Ave to Kelly Ave	4400	1693	0.38	B	1844	0.42	B	1850	0.42	B
	Multi-Lane Highway	Hwy 1 From Kelly Ave to Pine Ave	4400	1045	0.24	A	1587	0.36	B	1070	0.24	A
33	Two-Lane Highway	Hwy 1 between Kelly Ave and Filbert St	2800	**2081**	**0.74**	**E**	**2436**	**0.87**	**E**	2394	0.86	E
34	Two-Lane Highway	Hwy 1 between Filbert St and Poplar St	2800	**2149**	**0.77**	**E**	**2352**	**0.84**	**E**	2610	0.93	E
35	Two-Lane Highway	Hwy 1 between Poplar St and Grove St	2800	**1739**	**0.62**	**E**	**2022**	**0.72**	**E**	2287	0.82	E
36	Two-Lane Highway	Hwy 1 between Grove St and Seymour St	2800	**1916**	**0.68**	**E**	**2089**	**0.75**	**E**	2415	0.86	E
37	Multi-Lane Highway	Hwy 1 From Seymour St to Higgins Canyon Rd	4400	1024	0.23	A	1260	0.29	A	1561	0.35	A
	Multi-Lane Highway	Hwy 1 From Higgins Canyon Rd to Seymour St	4400	665	0.15	A	601	0.14	A	626	0.14	A
38	Multi-Lane Highway	Hwy 1 From Higgins Canyon Rd to Wavecrest Rd	4400	1165	0.26	A	1414	0.32	A	1716	0.39	A

Roadway Segment Number	Class	Location	Capacity	Buildout Condition								
				AM			PM			Sat Midday		
				Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]	Volume (veh/hr)	v/c	LOS[1]
	Multi-Lane Highway	Hwy 1 From Wavecrest Rd to Higgins Canyon Rd	4400	757	0.17	A	688	0.16	A	713	0.16	A
39	Two-Lane Highway	Hwy 1 between Redondo Beach Rd and Fairway Dr	2800	**1690**	**0.60**	**E**	**1946**	**0.70**	**E**	1977	0.71	E
40	Multi-Lane Highway	Hwy 1 From Fairway Dr and Miramontes Point Rd	4400	1004	0.23	A	1177	0.27	C	1266	0.29	C
	Multi-Lane Highway	Hwy 1 From Miramontes Point Rd to Fairway Dr	4400	487	0.11	A	574	0.13	B	647	0.15	B
41	Two-Lane Highway	Hwy 1 between Miramontes Point Rd and Dehoff Canyon Rd	2800	1123	0.40	D	1370	0.49	D	1465	0.52	D
42	Multi-Lane Highway	SR 92 from SR 1 to Main Street	4400	851	0.19	A	542	0.12	A	613	0.14	A
	Multi-Lane Highway	SR 92 from Main St to Hwy 1	4400	491	0.11	A	885	0.20	A	856	0.19	A
43	Two-Lane Highway	SR 92 Hwy 1 between Main Street and R Rd	2800	**2013**	**0.72**	**E**	**2461**	**0.88**	**E**	2314	0.83	E
44	Two-Lane Highway	SR 92 Hwy 1 between R Rd and Muddy Road	2800	**2078**	**0.74**	**E**	**2360**	**0.84**	**E**	2266	0.81	E
45	Two-Lane Highway	SR 92 Hwy 1 between Muddy Road and Skyline Blvd	2800	**2156**	**0.77**	**E**	**2474**	**0.88**	**E**	2457	0.88	E
46	Two-Lane Highway	SR 92 Hwy 1 between Skyline Blvd and SR 35	2800	**2657**	**0.95**	**E**	**3030**	**1.08**	**F**	**3117**	**1.11**	**F**
47	Two-Lane Highway	SR 92 Hwy 1 between SR 35 and I-280	2800	**2237**	**0.80**	**E**	**2516**	**0.90**	**E**	2669	0.95	E

[1] **Bolded** intersections fall below the defined LOS standard

Appendix A
Study Area Parking Inventory

Off-Street Parking Supply

Lot Name	ID	Spaces	Public/Private	Occupancy	Notes
North of Montara					
Devil's Slide Trail 1	1	15	Public	54 – 92%*	Free
Devil's Slide Trail 2	2	9	Public	54 – 92%*	Free
Gray Whale Cove State Beach	3	72	Public	< 50%*	Free
Gray Whale Cove Surplus	4	35	Public	< 50%*	Free
McNee Ranch State Park	5	7	Public	–	Free
Martini Creek	6	42	Public	100% AM, ~50% PM*	Free
Montara State Beach	7	8	Public	> 100%*	Free
La Costanera	8	40	Private/Public	–	Restaurant parking after 5pm. Is open to the public during the day
Montara					
Point Montara Lighthouse Hostel	9	25	Private	–	Hostel guests only
Montara Water & Sanitary District	10	15	Private	–	Restricted to MWSD
Moss Beach					
Fitzgerald Marine Reserve	11	35 + 5	Public	50% AM, > 100% PM*	Free
Church of Jesus Christ LDS	12	170	Private	–	Church parking
Moss Beach Distillery	13	43	Private/Public	–	Restaurant parking. 14 spaces in lot (closest to bluff) are available for public use from sunrise to sunset
Pillar Point & HAF Airport					
Harbor Lot A	14	322	Public	< 50%**	Free / Permit
Harbor Lot B	15	52	Public	< 50%**	Free
Harbor Lot C	16	147	Public	< 50%**	Permit
Boat Launch & Trailer Lot	17	135	Public	< 50%**	Reserved for fishermen
Harbor Commercial Fishermen Lot	18	40	Public	< 50%**	Permit
Pier	19	20	Public	< 50%**	
Launching Facility	20	18	Public	< 50%**	

Lot Name	ID	Spaces	Public/Private	Occupancy	Notes
Harbor Village Lot	21	488	Public/Private	< 50%**	
Pillar Point Inn	22	12	Private	< 50%**	
Barbara's Fish Trap	23	37	Private	< 50%**	
Half Moon Bay Brewing Co (SE)	24	43	Private	< 50%**	
Half Moon Bay Brewing Co (NW)	25	50	Private	< 50%**	
Half Moon Bay Yacht Club	26	14	Private	< 50%**	Open to public when club closed
Nasturtium	27	12	Private	< 50%**	
American Legion	28	27	Private	< 50%**	
Mezza Luna	29	37	Private	< 50%**	
Pillar Point Recreation Area	30	35	Public	< 50%**	
Jean Lauer Trailhead	31	10	Public	< 50%**	
West Point Ave & Stanford Lot	32	20	Public		
Half Moon Bay					
City Hall	33	~26	Public	–	
Ted Adcock Community Center	34	~19	Public	–	
Half Moon Bay Library	35	~36	Public	–	Library only
Dunes Beach	36	113	Public	100%***	$10 daily fee
Venice Beach	37	~134	Public	100%***	$10 daily fee
Francis Beach	38	146	Public	100%***	$10 daily fee
Poplar Beach	39	~71	Public	100%***	$2 hourly charge with electronic pay station
Redondo Beach	40	-20	Public	100%***	Unmarked/unpaved
Miramontes Point Road	41	14	Public	–	
State Route 92 (San Mateo Road)					
Scenic Overlook	42	12	Public	–	
Route 35 (Half Moon Bay Road)					
Lower Crystal Springs Reservoir	43	18	Public	–	

* Based on parking counts from Saturday July 12, 2014.
** Based on stakeholder interviews, typical occupancy is less than 50% in many lots
*** Based on stakeholder interviews, typical occupancy reaches 100% during peak times (summer weekends)

Appendix B
Development Assumptions by Subarea

Table A 1: Development Assumptions for Half Moon Bay Subarea

Zoning District	Permitted Density or Intensity	Projected Density or Intensity	Job Intensity and Job Mix
Non-Residential Districts			
C-R	Minimum lot size of 5,000 sq. ft. and minimum width of 50'; minimum 20' front yard, 5' rear and side setbacks; maximum height of 28'; maximum 50 percent site coverage for single-story and 35 percent coverage for multi-story	FAR of 0.6 based on average FAR allowed by zoning; 50 percent residential at 8.71 du/ac (30 percent of R-3 maximum density, ratio based on existing development)	1 job per 800 sq. ft.
C-G	Minimum lot size of 10,000 sq. ft. with minimum width of 100'; minimum 25' front yard, 10' rear and side setbacks; maximum 3 stories	FAR of 0.3 based on existing development; 50 percent residential at 8.71 du/ac (30 percent of R-3 maximum density, ratio based on existing development)	1 job per 600 sq. ft.
C-VS	Minimum lot size of 10,000 sq. ft. with minimum width of 100'; minimum 20' front yard, 10' rear and side setbacks; maximum 2 stories; maximum FAR of 0.5	FAR of 0.3 based on existing development; 10 percent residential at 5.66 du/ac (65 percent of R-1 maximum density, ratio based on existing development)	1 job per 1,000 sq. ft.
C-D	Minimum lot size of 5,000 sq. ft. with minimum width of 50'; setbacks (minimum 5') required only when abutting a residential R-district parcel; maximum 3 stories	FAR of 0.8 based on existing development; 50 percent residential at 8.71 du/ac (30 percent of R-3 maximum density, ratio based on existing development)	1 job per 600 sq. ft.
IND	Maximum height 40'; minimum building site of 10,000 sq. ft.; minimum 0' front yard, 5' side yard (20' when bordering R district), 0' rear yard (20' when bordering R district) setbacks	FAR of 0.2 based on existing development, multiplied by .75 to account for infrastructure and easements.	1 job per 1,200 sq. ft.
P-S	Maximum 4 stories (maximum height 50'); minimum lot size of 5,000 sq. ft.; minimum 20' front yard, 0' side yard (5' when bordering R district), 0' side yard (5' when bordering R district) setbacks	FAR of 0.2 based on existing development	1 job per 1,000 sq. ft.
Residential Districts			
R-1	Maximum 8.71 du/ac	6.53 du/ac (75 percent of maximum density, ratio based on existing development)	NA
R-1-B-1	Maxiumum 7.26 du/ac	6.53 du/ac (90 percent of maximum density, ratio based on existing development)	NA
R-1-B-2	Maximum 5.81 du/ac	5.52du/ac (95 percent of maximum	NA

Zoning District	Permitted Density or Intensity	Projected Density or Intensity	Job Intensity and Job Mix
		density, ratio based on existing development)	
R-1-B-3	Maximum 4.36 du/ac	1.74 du/ac (40 percent of maximum density, ratio based on existing development)	NA
R-2	Maximum 16.13 du/ac	8.07 du/ac (50 percent of maximum density, ratio based on existing development)	NA
R-3	Maximum 29.04 du/ac	23.23 du/ac (80 percent of maximum density, ratio based on existing development)	NA
MHP	Maximum 21.78 du/ac; site area minimum of 5 acres, maximum of 20 acres.	No potential development sites designated MHP	NA
Agriculture and Resource Management Districts			
A-1	Maximum height of 2.5 stories not exceeding 35'; minimum building site of 0.5 acres and average width of 100' for single-family dwellings (two dwellings allowed on minimum 5 acres and 1 additional dwelling for every 3 additional acres); maximum 4 dwellings per parcel; minimum 50' front yard, 20' side yard, 25' rear yard setbacks; minimum 25' distance between dwellings on the same parcel	0.02 du/ac based on existing development	1 job per 2 acres
OS-A	No new or additional dwellings; maximum structure height of 16'; setbacks required by use and proximity to sensitive features	FAR of 0; 0 du/ac	NA
OS-P	No new or additional dwellings; maximum structure height of 16'; setbacks required by use and proximity to sensitive features	FAR of 0; 0 du/ac	NA
OS-C	No new or additional dwellings; maximum structure height of 16'; setbacks required by use and proximity to sensitive features	FAR of 0; 0 du/ac	NA
OS-R	Maximum 0.02 du/ac with use permit; minimum new subdivision lot area of 50 acres; minimum lot area of 50 acres per dwelling; minimum 25' front, side, rear setbacks (50' from residential district); maximum height of 2 stories (28').	FAR of 0; 0.01 du/ac (50 percent of maximum density, ratio based on existing development)	NA

Zoning District	Permitted Density or Intensity	Projected Density or Intensity	Job Intensity and Job Mix
U-R	Dwelling units allowed for single-family or employee housing by use permit; minimum new subdivision lot area of 50 acres; minimum lot area of 15 acres per dwelling; minimum 25' front, side, rear setbacks (50' from residential district); maximum height of 2 stories (28').	FAR of 0; 0 du/ac	1 job per 2 acres
PAD		FAR of 0; 0 du/ac	1 job per 10 acres
Planned Development Districts (PUDs)			
Miramar Beach	LCP allows for maximum 15 dwelling units	FAR of 0; 0 du/ac (PUD is built out)	NA
Guerrero Avenue	LCP allows for maximum 46 dwelling units	FAR of 0; 0 du/ac (PUD is mostly built out, remaining vacant area may face constraints and lack of access)	NA
Surf Beach/Dunes Beach	LCP allows for maximum 150 dwelling units; at least 20 acres for commercial recreation or visitor serving uses	92 du (92 vacant lots remaining north of Young Ave.); 8,713 sq. ft. for C-VS development (75 percent of 8.89-acre site south of Young Ave. using typical 0.3 FAR)	See C-VS
Venice Beach	LCP allows for maximum 75 dwelling units	71 du (maximum minus 4 existing single-family dwellings)	NA
Nurserymen's Exchange	LCP allows for maximum 80 dwelling units at 1 du/7,500 sq. ft.	FAR of 0; 0 du/ac (PUD is built out)0	NA
Dykstra Ranch (Pacific Ridge)	LCP allows for maximum 228 dwelling units	FAR of 0; 0 du/ac (63 planned units included as part of expected development)	NA
Carter Hill	LCP allows for maximum 50 dwelling units	25 du (assuming environmental constraints)	NA
Pilarcitos West Urban Reserve	LCP limits future development to agriculture and agriculture-related uses	FAR of 0; 0 du/ac	NA
Matteucci	LCP allows for maximum 42 dwelling units	2 du (PUD is mostly built out)	NA
Podesta	LCP allows for maximum 125 dwelling units on 40 percent of the site area; industrial development on 60 percent of site area; 25 percent of project area must be open space	125 du (maximum allowed by LCP); 102,688 sq. ft. for IND development on 60 percent of the site (minus 60 percent of the 25-percent open space requirement) with 0.2 FAR and 75 percent flex factor to account for infrastructure and easements	See IND
Andreotti (Cypress	LCP allows for maximum 130 dwelling units on 40 percent of the site area;	FAR of 0.3 for potential commercial development on parcels fronting SR	NA

Zoning District	Permitted Density or Intensity	Projected Density or Intensity	Job Intensity and Job Mix
Cove)	commercial development on 60 percent of site area; 25 percent of project area must be open space	92	
West of Railroad	LCP allows for maximum 65 dwelling units	FAR of 0; 0 du/ac (LCP-preferred alternative is public acquisition)	NA
Amesport Landing	NA	FAR of 0; 0 du/ac (PUD is built out)	NA
Cassinelli & South Main Street	LCP allows for maximum 35 dwelling units or light industrial or commercial development	FAR of 0; 0 du/ac (PUD is built out)	NA
North Wavecrest	LCP allows for maximum 1,000 dwelling units; 15 acres may be reserved for community recreation; at least 30% of the site reserved for open space; at least 10 acres reserved for RV park	153 single-family du; 38 multi-family du; 460,920 sq. ft. for low-density visitor-serving commercial development at 0.15 FAR (19 percent of original Wavecrest PUD remains vacant and privately owned, the same proportion of original 1,000 units allowed is 191 units, 38 must be affordable and are assumed to be multi-family; 88 acres remain for commercial development, multiplied by 80 percent for infrastructure and easements	See C-VS
LC Smith	LCP allows for development at density of surrounding land uses (14.8-18.3 du/ac, 2-3 stories); 5,000 sq. ft. reserved for public facility; 20 percent reserved as open space	FAR of 0; 0 du/ac (8 potential du and 37,480 sq. ft. of non-residential space included as part of expected development)	NA
Carnoustie	NA	FAR of 0; 0 du/ac (32 planned units included as part of existing and expected development)	NA
Ocean Colony	NA	FAR of 0; 0 du/ac (PUD is built out)	NA
South Wavecrest	NA	FAR of 0; 0 du/ac (PUD is built out)	NA

Note:

Projections for residential development are consistent with the Measure D Growth Allocation program (residential growth corresponds to no more than 1.5 % population growth annually).

For PUD areas, actual density and intensities are defined at the time of development, and may be affected by complex factors such as environmental constraints and the presence of sensitive features. Therefore, actual densities and intensities may be higher or lower than those assumed here.

Table A 2: Development Assumptions for Princeton Subarea

Zoning District	Permitted Density or Intensity	Projected Density or Intensity	Job Intensity and Job Mix
Non-Residential Districts			
CCR	Maximum 50% lot coverage; a combined 15' setback required; maximum building height of 36'.	FAR of 0.5 based on existing development 0.5 du/ac.	1 job per 1,000 sq. ft. building area 75% service, 25% retail jobs
M-1	Maximum building height of 75'; side and rear yards (3' and 6' respectively) required when abutting an "R" District.	FAR of 0.4 based on existing development	1 job per 1,200 sq. ft. building area. 50% mfg, 25% wholesale, 25% service jobs
M-1/AO	Same as above	FAR of 0.2 (because of AO restrictions on persons per acre).	Same as above
W	Maximum 60% lot coverage; maximum building height of 36'. Caretaker units allowed as accessory use on up to 25% of developed parcels	FAR of 0.7 based on existing development	1 job per 1,200 sq. ft. building area. 50% mfg, 25% wholesale, 25% service jobs
W/AO		FAR of 0.2 (because of AO restrictions on persons per acre)	Same as above
Residential Districts			
R-1/S-17	I du/5,000 sf	I du/parcel	NA
R-1/S-17/AO	Same as above	Same as above	NA
R-1/S-13	1 du/5 acres	1 du/parcel	NA
H-1	5' side yard and 20' rear yard required.	Build-out of Pillar Ridge Manufactured Home Community	NA
Agriculture and Resource Management Districts			
PAD		FAR of 0; 0 du/ac	1 job per 10 acres
RM-CZ	Maximum height of 3 stories or 36'. Minimum 50' front yard, 20' side and rear setbacks.	FAR of 0; 0 du/ac	0
RM-CZ/AO	Same as above	FAR of 0; 0 du/ac	0

Table A 3: Development Assumptions for Midcoast Subarea

Zoning District	Permitted Density or Intensity	Projected Density or Intensity	Job Intensity and Job Mix
Non-Residential Districts			
C-1/S-3	2 stories, 20' front and rear yards, 5' side yards 50% lot coverage and 3 stories for buildings that include residential, with 20' front and rear yard, 5' side yards	0.54 FAR, based on average of existing development in the zone. 8.7 du/ac	1 job per 600 sf building area 50% service, 50% retail jobs
CCR	3 stories, 50% lot coverage, 15' side yards (combined),	0.68 FAR, based on average of existing development in the zone. 8.7 du/ac	1 job per 1,000 sf building area 75% service, 25% retail jobs
EG	1 story, 10% lot coverage, 50' front, 20' side, 20' rear setbacks	0.10 FAR	1 job per 1,000 sf building area 75% service, 25% retail jobs
PUD-120	Determined individually	0.54 FAR, 8.7 du/ac, based on adjacent C-1/S-3	1 job per 600 sf building area 50% service, 50% retail jobs
PUD-121	Determined individually	0.54 FAR, 8.7 du/ac, based on adjacent C-1/S-3	1 job per 600 sf building area 50% service, 50% retail jobs
PUD-124	Determined individually	17.4 du/ac, based on LCP policy for affordable housing sites	1 job per 600 sf building area 50% service, 50% retail jobs
Residential Districts			
R-3/S-3	I du/1,250 sf	I du/1,250 sf (34.8 du/ac)	NA
R-3-A/S-5	I du/2,500 sf	I du/2,500 sf (17.4 du/ac)	NA
R-1/S-17	I du/5,000 sf. Second unit allowed on standard lots	I unit per lot for lots smaller than 0.5 ac I du/5,000 sf (8.7 du/ac) for larger lots Second unit assumed on standard lots Contiguously owned substandard lots assumed to be merged	NA
R-1/S-94	I du/10,000 sf Second unit allowed on standard lots	I unit per lot for lots smaller than 0.5 ac I du/10,000 sf (4.4 du/ac) for	NA

Zoning District	Permitted Density or Intensity	Projected Density or Intensity	Job Intensity and Job Mix
		larger lots Second unit assumed on standard lots Contiguously owned substandard lots assumed to be merged	
R-1/S-105	1 du/20,000 sf Second unit allowed on standard lots	I unit per lot for lots smaller than 0.5 ac 1 du/20,000 sf (2.2 du/ac) for larger lots Second unit assumed on standard lots Contiguously owned substandard lots assumed to be merged	NA
Agriculture and Resource Management Districts			
PAD	1 du/160 ac for prime ag 1 du/160 ac for landslide susc. 1 du/160 ac for slope 50% + 1 du/160 ac for remote lands 1 du/80 ac for slope 30-50% 1 du/80 ac for rift zone or active fault 1 du/60 ac for flood hazard areas 1 du/60 ac for slope 15-30% 1 du/60 ac for ag preserves or exclusive ag districts	1 du/110 ac	1 job per 10 acres
RM-CZ	Same as above	Same as above	NA
Note: The Midcoast LCP uses a parcel-based analysis for single-family development, and assumes merging of contiguously owned substandard lots. This approach requires property ownership data which was not available in time for this analysis. This approach would likely result in slightly lower development projections.			

Table A 4: Development Assumptions for Rural Lands Subarea

Zoning District	Permitted Density or Intensity	Projected Density or Intensity	Job Intensity and Job Mix
Residential Districts			
R-1/S-17	I du/5,000 sf	I du/5,000 sf	NA
R-E/S-11	1 du per 1 to 5 acres depending on slope	1 du/3 ac	NA
Agriculture and Resource Management Districts			
PAD	1 du/160 ac for prime ag 1 du/160 ac for landslide susc. 1 du/160 ac for slope 50% + 1 du/160 ac for remote lands 1 du/80 ac for slope 30-50% 1 du/80 ac for rift zone or active fault 1 du/60 ac for flood hazard areas 1 du/60 ac for slope 15-30% 1 du/60 ac for ag preserves or exclusive ag districts	1 du/110 ac	1 job per 150 acres 100% agricultural and natural resource jobs
RM	Same as above	Same as above	NA
RM-CZ	Same as above	Same as above	NA

Appendix C
CAPACITY OF WATER AND WASTEWATER SYSTEMS

Existing Potable Water Infrastructure

The water distribution system for the northern portion of the unincorporated Midcoast is owned and operated by Montara Water and Sanitary District (MWSD). MWSD's water supply sources include Montara Creek and Denniston Creek. Water is delivered to the system through the Alta Vista Water Treatment Plant north of Montara, as well as from nine groundwater well locations. The water distribution system consists of three water storage tanks, which have a combined capacity of 662,000 gallons, and over 3.4 miles of distribution pipelines ranging from 2- to 16-inch mains.[11]

The water distribution system for the southern portion of the unincorporated Midcoast and Half Moon Bay is owned and operated by Coastside County Water District (CCWD). CCWD's water supply sources include Pilarcitos Lake, Upper Crystal Springs Reservoir, Pilarcitos Well Field and Denniston Creek. The primary water supply source is purchased from the SFPUC (Pilarcitos Lake and Upper Crystal Springs Reservoir). Other supplies (about 10 percent in 2010) comprise Infiltration Well water from the District's Pilarcitos well field, and surface water and groundwater from the District's Denniston Project. Water is delivered to the system through one of two treatment plants: the Denniston Water Treatment Plant near Half Moon Bay Airport and the Nunes Water Treatment Plant in Half Moon Bay. The water distribution system consists of 11 treated water storage tanks, which have a combined storage capacity of 8.1 million gallons, and over 100 miles of transmission and distribution pipelines.[12]

In addition, private water wells are used in areas not served by public water systems, and in some cases when public water systems do not allow connection.

Existing Potable Water Capacity and Demand

Water Capacity Reserved for Priority Uses

For the unincorporated Midcoast, both MWSD and CCWD have water capacity reserved for priority land uses defined by the Coastal Act and Midcoast Local Coastal Program (LCP). The reserved water capacity amounts are included in Table 2.17 of the Midcoast LCP Policies, June 2013, reproduced here as Table B 1. Based on original buildout estimates from 1980 (Table 1.1 of the LCP), MWSD has approximately 82,480 gallons/day for Phase 1 (year 2000) and 61,126 to 76,814 gallons/day for full buildout. CCWD has approximately 369,716 gallons/day allocated for priority uses for Phase 1 (year 2000) and 490,404 to 532,036 gallons/day allocated for priority uses at full buildout.

Table B 1: Amount of Water Capacity to be Reserved for Priority Land Uses[1]

ALLOCATION OF RESERVED CAPACITY TO PRIORITY LAND USES	Phase 1		Buildout	
	Units	Gallons/Day	Units	Gallons/Day
Montara Water and Sewer District (Montara/Moss Beach)				

[11] SRT Consultants, "Montara Water and Sanitary District Water System Master Plan" (December 2011).

[12] Coastside County Water District website, "Distribution" (2013).

ALLOCATION OF RESERVED CAPACITY TO PRIORITY LAND USES	Phase 1		Buildout	
	Units	Gallons/Day	Units	Gallons/Day
Coastal Act Priorities				
Marine-Related Industrial	–	–	–	–
Commercial Recreation	.57 acres	1,100	.82 acres	1,230
Public Recreation	282 persons	3,200	408 persons	4,080
Floriculture		18,800		10,000
Essential Public Services[2]				5,000
Local Coastal Program Priorities				
Specific Developments on Designated Sites Containing Affordable Housing	148	64,380	148	35,816 to 51,504
Other Affordable Housing			20	5,000
Total Water Capacity for Priority Land Uses		82,480		61,126 to 76,814
Percent of Total Water Capacity for Priority Land Uses		10.6%		5.4 to 9.2%
Percent of Buildout Allowed by Phase		50 to 69%		100%
Total Water Capacity		778, 800		836,300 to 1,128,700
Coastside County Water District (County Jurisdiction)				
Coastal Act Priorities				
Marine-Related Industrial	22.85 acres	55,770	29.29 acres	71,870
Commercial Recreation	33.15 acres	61,630	42.50 acres	79,395
Public Recreation	248 persons	2,900	318 persons	3,700
Floriculture		179,400		220,000
Essential Public Services[2]		7,700		14,135
Local Coastal Program Priorities[4]				
Specific Developments on Designated Sites Containing Affordable Housing	104	39,936	322	77,924 to 112,056
Other Affordable Housing[5]			20	5,000
Consolidated Lots in Miramar	55	20,900	70	16,900 to 24,400
Historic Structures[3]	1	14,480	1	1,480
Total Water Capacity for Priority Land Uses		369,716		490,404 to 532,036

ALLOCATION OF RESERVED CAPACITY TO PRIORITY LAND USES	Phase 1		Buildout	
	Units	Gallons/Day	Units	Gallons/Day
Percent of Total Water Capacity for Priority Land Uses		29.4%		30.4 to 41.8%
Percent of Buildout Allowed by Phase		59 to 78%		100%
Total Water Capacity for Priority Land Uses		1,257,000		1,273,600 to 1,611,600

Notes:
1. Capacity shall be reserved for additional priority land use development when service provider develops new supplies to serve new connections on vacant lands. Does not include existing, developed priority land uses at time of LCP adoption.
2. Essential public services include the following uses: Emergency Facilities, Correctional Facilities, Transportation Facilities (public), Utility Facilities, Hospitals, Skilled Nursing Facilities, Intermediate Care Facilities, Libraries, Community Centers, Elementary and Secondary Schools, Institutional Day Care Facilities for Children (Day Care Centers as defined by State law), Adults and the Elderly, Institutional Full-Time Care Facilities for Children and Adults, Institutional Shared Housing Facilities for the Elderly and One-Family Dwellings with Failed Domestic Wells. These services must be provided by a public agency or private non-profit or government-funded (partially or fully) purveyor to be considered an essential public service. The reserve capacity allocated to these priority uses may not be shared by any associated, non-priority use and must be forfeited when the priority use is discontinued. 12,710 gallons/day are reserved for One-Family Dwellings with Failed Domestic Wells. This reservation is allocated as follows: Coastside County Water District - 7,710 gallons/day (30 units) Montara Water and Sanitary District - 5,000 gallons/day (20 units)
3. In order to qualify for priority, historic structures must meet the criteria contained under LCP Policy 2.31c(6).
4. Where development of new public water facilities can accommodate only a limited amount of new connections on vacant land, adequate capacity for Coastal Act priority uses shall be reserved before reserving capacity for Local Coastal Program priority uses.
5. Affordable means as defined by Section 6102.48.6 of the certified zoning regulations, and subject to income and cost/rent restrictions for the life of the development.

Source: San Mateo County Midcoast LCP, 2013

The Half Moon Bay Local Coastal Land Use Plan, from 1993, also establishes priority and non-priority water use allocations. The Half Moon Bay LCP establishes a phased reservation of CCWD water for priority uses in Half Moon Bay, out to the year 2000. As shown in Table B 2 (Table 10.4 in the LCLUP), priority uses include Commercial Recreation, Public Recreation, and Floriculture. Amounts are based on the allocation of land use in the Land Use Plan and proposed development phasing. The LCLUP anticipated that most of the irrigational needs for local recreation would be met through the use of reclaimed wastewater from the sewage treatment facilities. However, there is currently no recycled water system that serves the City of Half Moon Bay. The Sewer Authority Mid-Coastside (SAM) Treatment Plant, located west of Highway 1 between Frenchmans Creek and Pilarcitos Creek, would need costly infrastructure improvements to upgrade from secondary to tertiary treatment in order to produce recycled water. CCWD has shown interest in reaching an agreement with SAM to produce and distribute recycled water, but does not have a recycled water master plan at this time.[13]

[13] West Yost Associates, "Coastside County Water District 2010 Urban Water Management Plan Update", June 2011.

Table B 2: New CCWD Water Capacity to be Reserved for Priority Land Uses Under the Half Moon Bay LCP at Year 2000

Coastal Act Priorities	Annual Demand (mgd)
Marine-Related Industrial	-
Commercial Recreation	
Equestrian Facilities	.01
Hotel/Motel	.03
Restaurant	–
Subtotal	.04
Public Recreation	
Local Recreation (local parks, playfields)	.02
Campsites	.02
Beaches	.02
Subtotal	.06
Public Recreation	
Local Recreation (local parks, playfields)	.02
Campsites	.02
Beaches	.02

Source: City of Half Moon Bay Local Coastal Land Use Plan, 1993.

Water Demand

MWSD currently serves over 1,600 residential and 30 commercial connections for a maximum daily demand of over 473,000 gallons per day (gpd).[14] Based on the MWSD Public Works Plan, December 2013, MWSD has 128,000 gallons per day available to be utilized for new service connections, beyond those connections existing as of December 11, 2013. 80,959 gallons per day is currently required to be reserved for priority uses, as described above. 47,041 gallons per day are available for non-priority uses.

CCWD's baseline per capita water use in 2010 was 128 gallons per capita per day (gpcd) according to the 2010 Urban Water Management Plan Update. In order to comply with the Water Conservation Act of 2009, CCWD's target per capita water use is 120 gpcd by 2020. The water demand in 2010 was approximately 2,265 acre-feet per year (afy) and is projected to reach 3,149 afy by 2035. The District plans to meet the 2035 water demand projection with 730 AFY from Denniston Creek, 150 AFY from Pilarcitos well field, and 2,269 AFY from the SFPUC. The District is currently entitled to purchase approximately 2,455 afy from the SFPUC. This entitlement will not be increased before 2018, and because availability of additional water from SFPUC after 2018 is uncertain, the District assumes for planning purposes that this supply will not be increased.

[14] SRT Consultants, "Montara Water and Sanitary District Water System Master Plan" (December 2011).

System Deficiency of Potable Water

MWSD issued a Water System Master Plan in 2011 to address the current and future water demands in the district in order to create a baseline for the Capital Improvements Program. The required volume of storage for MWSD's existing water system included operational, emergency, and fire-fighting demand. The analysis resulted in a current storage deficit of over 333,000 gallons in 2010 and an anticipated deficit of over 575,000 gallons by 2020.

As described in the Midcoast LCP, new public water service connections in MWSD must be consistent with the MWSD Public Works Plan (Coastal Commission PWP No. 2-06-006). The most recent amendment to the Public Works Plan was approved by the Coastal Commission in December 2013. As described in the MWSD Public Works Plan, any increase in water supply or distribution capacity to provide additional service connections must be reviewed by the Coastal Commission. The Commission would then evaluate the proposed increase to see if it increased capacity in the water system is matched with adequate capacity of other area infrastructure, including but not limited to the need for adequate transportation levels of service on Highways 1 and 92. Based on information provided by Montara Water and Sanitary District, MWSD does not allow the trading of existing water service connections, nor does MWSD issue any new connections without a planning agency's approval. MWSD provides water and sewer service to all developments within its boundary that receives a building permit from San Mateo County.

In April 2011, CCWD adopted a Water Shortage Contingency Plan providing a response plan in the event of prolonged drought, water supply shortages, or emergency outages. During normal year comparison, CCWD's water supplies are adequate to meet projected demands. CCWD currently has an ongoing pipeline replacement program to replace sections of old and damaged pipelines throughout the Study Area with new ductile iron pipelines to reduce leaks and minimize losses throughout the system.15

Currently, CCWD has 209 unsold priority water service connections (5/8" size) and zero unsold non-priority water service connections. New non-priority developments must trade or purchase water service connections from existing owners, not from CCWD. New development that relies upon water from CCWD must be consistent with the Coastal Development Permit (CDP) for the El Granada Pipeline Project (Coastal Commission CDP A-2-SMC-99-063; A-1-HMB-99-020). This requirement is also included in the Midcoast LCP. As described in the El Granada Pipeline Project CDP, future expansion of the water supply system to support growth in excess of the existing development level shall not be approved unless the regional transportation system, specifically Highways 1 and 92, is improved to provide adequate levels of service.

Sanitary Sewer System

Sanitary sewer service is provided by Montara Water and Sanitary District (MWSD), Granada Sanitary District (GSD), and the City of Half Moon Bay for transporting sewage flows, and Sewer Authority Mid-Coastside (SAM) for treating and disposing the sewage. SAM is a public agency providing wastewater treatment services to MWSD, GSD, and Half Moon Bay under a joint powers agreement. Each member agency of SAM is allotted maximum capacity rights for Peak Wet Weather Flow (PWWF), Average Dry Weather Flow (ADWF), Biochemical Oxygen Demand (BOD) and Suspended Solids. These allocations correspond to the sewer treatment capacity and the sewer transmission capacity.

[15] West Yost Associates, "2010 Urban Water Management Plan Update" (June 2011).

Existing Sanitary Sewer Infrastructure

MWSD's existing sanitary sewer system consists of approximately 25 miles of sewer lines and 13 lift stations. GSD's existing sanitary sewer system includes approximately 33 miles of sewer line and approximately 1,500 feet of force main running along Highway 1. Granada Sanitary District's existing sanitary sewer system includes approximately 33 miles of sewer line and approximately 1,500 feet of force main running along Highway 1.16 The City of Half Moon Bay's existing sanitary sewer system consists of approximately 37 miles of sewer mains, approximately 3,100 laterals, and three lift stations.17 The SAM owns and operates an 8-mile stretch of transmission main, also known as the Intertie Pipeline System (IPS). Four main lift stations are used to connect to the three member agencies' sewer distribution systems of the SAM Treatment Plant. Approximately 1.8 miles of the IPS are gravity mains, while the remaining portion is force main.

In addition, private on-site wastewater disposal systems (septic) are used in areas not served by centralized sewage collection systems.

Existing Sewage Treatment Capacity

Both MWSD and GSD have sewage treatment capacity reserved for priority land uses defined by the Coastal Act and the Midcoast and Half Moon Bay Local Coastal Programs.

For the unincorporated Midcoast, the reserved sewage treatment capacity amounts are included in Table 2.7 of the Midcoast LCP, which is reproduced here as Table B 3. Based on original buildout estimates from 1980 (Table 1.1 of the Local Coastal Program), MWSD has approximately 400,000 gallons/day for Phase 1 (year 2000) and 580,090 to 794,080 gallons/day at full buildout. GSD has approximately 600,000 gallons/day for Phase 1 (year 2000) and 762,475 to 1,009,765 gallons/day for full buildout.

Table B 3: Sewage Treatment Capacity to be Reserved for Priority Land Uses[1]

ALLOCATION OF RESERVED CAPACITY TO PRIORITY LAND USES	Phase 1		Buildout	
	Units	Gallons/Day	Units	Gallons/Day
Montara Water and Sanitary District				
Coastal Act Priorities				
Marine-Related Industrial	-	-	-	-
Commercial Recreation	.56 acres	840	.82 acres	1,230
Public Recreation	282 persons	2,820	408 persons	4,080
Local Coastal Program Priorities				
Specific Developments on Designated Sites	148	32,708	365	66,430 to

[16] Sewer Authority Mid-Coastside, "Sewer System Management Plan", 2008.
[17] City of Half Moon Bay Public Works, "Sewer System Study", March 2010.

ALLOCATION OF RESERVED CAPACITY TO PRIORITY LAND USES	Phase 1		Buildout	
	Units	Gallons/Day	Units	Gallons/Day
Containing Affordable Housing				94,900
Total Sewage Treatment Capacity for Priority Land Uses		36,368		71,740 to 100,210
Percent of Total Sewage Treatment Capacity for Priority Land Uses		9.1%		9.0 to 17.3%
Percent of Buildout Allowed by Phase		50 to 69%		100%
Total Sewage Capacity		400,000		580,090 to 794,080
Granada Sanitary District				
Coastal Act Priorities				
Marine-Related Industrial	22.85 acres	45,700	29.29 acres	58,580
Commercial Recreation	33.15 acres	49,725	42.50 acres	63,750
Public Recreation	248 persons	2,480	318 persons	3,180
Essential Public Services[2]		3,800		5,125
Local Coastal Program Priorities				
Specific Developments on Designated Sites Containing Affordable Housing	104	22,984	104	18,928 to 27,040
Consolidated Lots in Miramar	55	12,155	704	12,240 to 18,200
Total Sewage Treatment Capacity for Priority Land Uses		136,844		162,303 to 175,875
Percent of Total Sewage Treatment Capacity for Priority Land Uses		22.8%		16.5 to 22.5%
Percent of Buildout Allowed by Phase		59 to 78%		100%
Total Sewage Capacity		600,000		762,475 to 1,009,765

NOTES:

1 Capacity reserved for additional priority land use development. Does not include existing, developed priority land uses at time of LCP adoption.

2 Essential public services include the following uses: Emergency Facilities, Correctional Facilities, Transportation Facilities (public), Utility Facilities, Hospitals, Skilled Nursing Facilities, Intermediate Care Facilities, Libraries, Community Centers, Elementary and Secondary Schools, Institutional Day Care Facilities for Children (Day Care Centers as defined by State law), Adults and the Elderly, Institutional Full-Time Care Facilities for Children and Adults, and Institutional Shared Housing Facilities for the Elderly. These services must be provided by

ALLOCATION OF RESERVED CAPACITY TO PRIORITY LAND USES	Phase 1		Buildout	
	Units	Gallons/Day	Units	Gallons/Day
a public agency or private non-profit or government-funded (partially or fully) purveyor to be considered an essential public service. The reserve capacity allocated to these priority uses may not be shared by any associated, non-priority use and must be forfeited when the priority use is discontinued				

For the City of Half Moon Bay, the reserved sewage treatment capacity amounts are included in Table 10.4 of the Half Moon Bay LCLUP, reproduced here as Table B 4. The City of Half Moon Bay's sewer system has approximately 60,000 gallons/day for full buildout (year 2000), split evenly between Commercial/Recreational and Public Recreation uses. Granada Sanitary District has approximately 10,000 gallons/day, for public recreation uses.

Table B 4: Sewage Treatment Capacity to be Reserved for Priority Land Uses Under the Half Moon Bay LCP (mgd, adwf)

Coastal Act Priorities	City of Half Moon Bay	Granada Sanitary District	Total
Commercial/Recreational	.03	--	.03
Public Recreation	.03	.01	.04
Total	.06	.01	.07

Source: City of Half Moon Bay Local Coastal Land Use Plan, 1993.

Existing SAM Treatment Plant Capacity

The capacity at the wastewater treatment plant is 4.0 MGD (millions of gallons per day) in Average Dry Weather Flow (ADWF). Currently, the ADWF is 1.7 MGD. Biochemical Oxygen Demand (BOD) and Suspended Solids are the parameters used to evaluate the treatment capacity required at the SAM treatment plant. For any development project proposed in the Study Area, the average daily flow would be based on the net increase produced by the site redevelopment and adjusted for BOD and suspended solids.

Existing System Deficiencies

SAM, the Montara Water and Sanitary District, the Granada Sanitary District, and the City of Half Moon Bay have an ongoing capacity management program to address hydraulic capacity issues within their district limits. The Intertie Pipeline System that conveys wastewater from Granada Sanitary District to the SAM Treatment Plant has had capacity issues, including surcharge in some manholes, during heavy rain periods in the past.

The MWSD sewer system is largely built-out and the existing pipe conditions should be assessed by the district. This will help identify locations causing capacity issues due to pipe diameter, sags, blockages, and roots. The district is continually assessing the current and future capacity requirements for its collection system; especially downstream portions near existing pump stations.

The GSD has performed a sanitary sewer monitoring program that identified inflow and infiltration at locations in the district's collection system. Proposed mitigation measures for these locations include better mapping of the district's collection system, followed by field verification of the locations and elevations to identify capacity issues. GSD has a capital improvements program to replace older clay sewers (circa 1920) and sewers in known problem areas.

The City of Half Moon Bay sewer collection system generally has adequate capacity to serve current levels of flow. The City has initiated a sewer system study to identify existing system deficiencies and prioritize improvements necessary to accommodate peak period flows. The City has also completed a tv/video inspection of the 37 miles of sewer mains to help identify locations causing capacity issues due to deteriorated pipes/joints, sags, blockages and tree roots. Sewer main improvements/rehabilitation, flow monitoring, lift station upgrades, and map updates are all items in the FY 2014/15 Capital Improvement Program budget.