

# ALTERNATIVES ANALYSIS

## for the Monterey Peninsula Fixed Guideway Corridor Study

— Summary Report



CUSTOM HOUSE PLAZA

NAVAL POSTGRADUATE

SAND CITY

DOWNTOWN SEASIDE

CASA VERDE WAY

FIRST ST.

EIGHTH ST.

MARINA CIVIC CE



Kimley-Horn and Associates, Inc.

PARSONS

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*Alternatives Analysis for the Monterey Peninsula Fixed-Guideway Corridor Study, Volume 1: Final Alternatives Analysis Report, December 2008 and updated December 2009*

*Alternatives Analysis for the Monterey Peninsula Fixed-Guideway Corridor Study, Volume 2: Locally Preferred Alternative, February 2011*

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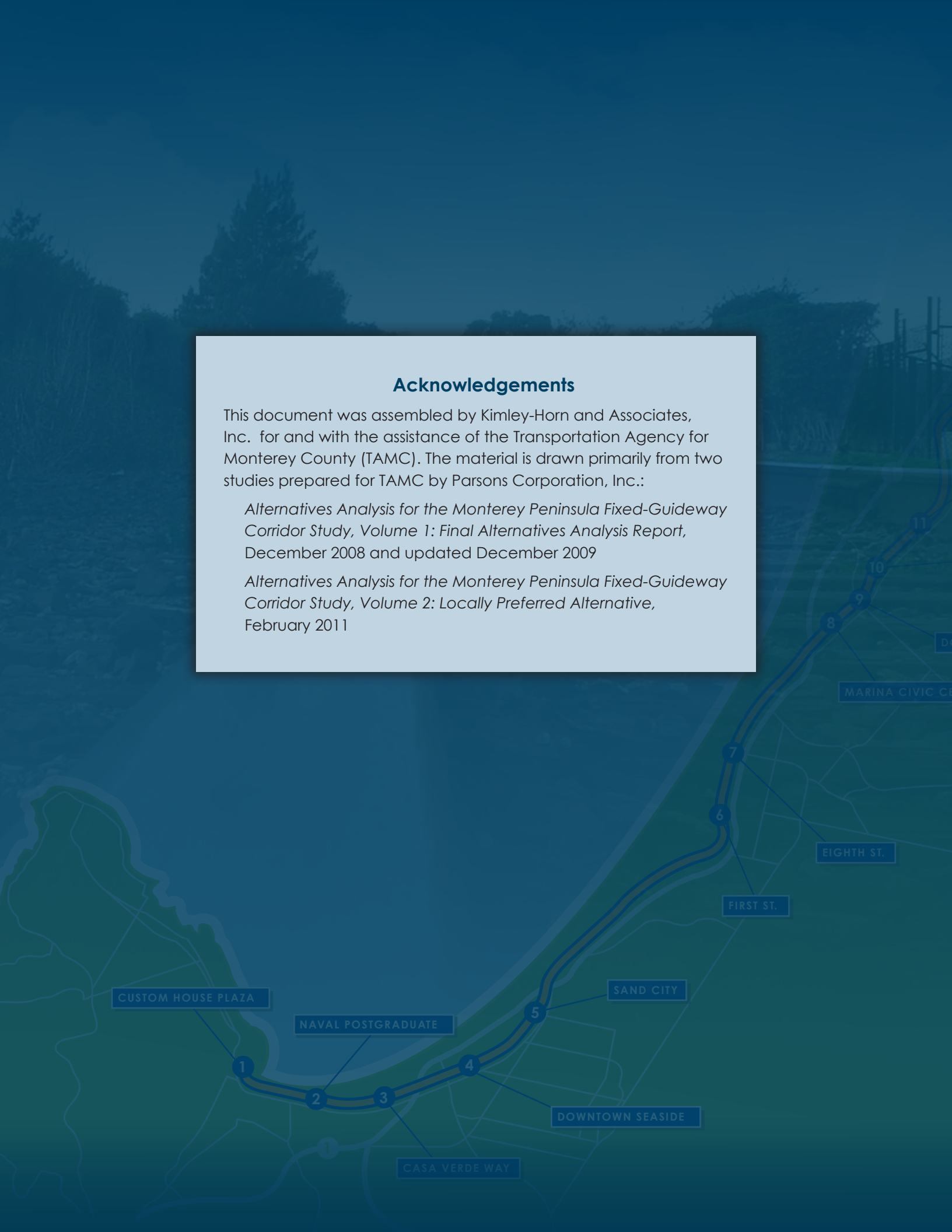
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## Abstract

### Alternatives Analysis for the Monterey Peninsula Fixed-Guideway Corridor Study

The Monterey Peninsula of Monterey County is a dynamic and growing area. It is one of California's major tourist areas, with numerous natural and man-made attractions. The local economy is also supported by the expansion of businesses serving educational, medical, and agricultural uses. With growth, however, comes increased travel demand—and congestion. Policy makers and the public are cognizant of the special challenges the region faces in accommodating growth, improving mobility and also preserving the matchless natural environment. The region, through its regional transportation planning agency, the Transportation Agency for Monterey County (TAMC), is prioritizing transportation investments that will enhance mobility without generating unacceptable environmental impacts. Transit has been identified as key investment strategy by the public and local decision makers.

TAMC has completed systems planning studies that identified two types of mobility needs facing the county, and two corridors were targeted for further study of possible transit improvements:

- (1) Inter-county travel continues to grow between Monterey County and the metropolitan areas of primarily Santa Clara County and San Francisco to the north. This main inter-county travel corridor is U.S. 101.
- (2) Intra-county travel among coastal communities along the Monterey Peninsula and between coastal cities and the city of Salinas is also increasing, corresponding to continued business and residential development. The main intra-county travel corridor along Monterey Peninsula is State Route 1 (SR-1).

An evaluation of inter-county transportation improvement alternatives was undertaken as an alternatives analysis following Federal Transit Administration (FTA) guidance for implementation of major transit investments. The analysis recommended extending commuter rail from Gilroy in Santa Clara County along the existing Union Pacific Railroad line (which parallels U.S. 101) to Salinas. That project is now proceeding through environmental clearance. Similarly, for intra-county travel, in 2005 TAMC initiated an alternatives analysis of various rail and bus improvements that were developed from recommendations of the systems planning studies and extensive public and local agency input. The Monterey Peninsula Fixed-Guideway Study Alternatives Analysis identified a preferred transit investment that includes phased Light-Rail Transit (LRT) along the abandoned Monterey Branch Rail Line paralleling SR-1. As part of the phased approach, LRT would first connect Monterey, Sand City, Seaside and Marina by approximately 2015 and subsequently extend to meet the planned commuter rail extension in Castroville as the corridor develops. The Branch Line is owned by TAMC and the cities of Seaside and Monterey. The preferred transit alternative also includes improved bus connections to Castroville, the Fort Ord Redevelopment Area and Salinas, expanding the mobility benefits of the project.

This Summary Report provides an overview of the alternatives analysis leading to the formal adoption of phased LRT as the locally preferred alternative for the Monterey Peninsula corridor.

### Purpose and Need for Monterey Peninsula Transit Improvements

The Monterey Peninsula Fixed-Guideway Study Alternatives Analysis documented the transportation problems of the study corridor and purpose of a major investment in transit infrastructure. Transportation problems include significant congestion and deteriorating roadways, a lack of competitive alternatives to the private automobile, physical constraints on existing transit operating speeds and capacity, need for general improvement in providing efficient mobility for low-income residents, and need for transportation infrastructure to serve areas of growth and development through a transit-oriented development process.

Recent transportation improvements have failed to keep pace with the area's recent growth, and currently planned improvements will not be adequate to address anticipated future growth. For instance, for portions of SR-1 in the project corridor that already operate above their daily capacity, traffic volumes are projected to grow by 21 percent between 2000 and 2030. The growth is almost entirely driven by local trips originating on the Peninsula and in



Salinas and destined for employment centers in Monterey. The Regional Transportation Plan indicates that vehicle-hours of delay on county roadways will more than triple between 2005 and 2035. Major freeway widening projects are uncertain given the current and anticipated future funding situation and their impact on the environment.

The continuing deterioration in roadway conditions will adversely affect operations of existing bus services in the corridor. Line 20, the most heavily used bus route along the Monterey Peninsula project corridor, currently has on-time performance problems particularly during the afternoon peak.

Public and local decision-maker input to the alternatives analysis have made clear that the preferred investment strategy for the Monterey Peninsula must achieve a threefold purpose of a) improving the balance of the transportation facilities and services, thereby expanding mobility options of Peninsula residents; b) removing or, at minimum, significantly reducing the growth in auto trips along SR-1; and (c) providing a system that drives economic growth consistent with local plans for transit oriented development, state mandates (e.g., SB 375), and local environmental and sustainability goals. An additional consideration is to ensure the investment strategy is affordable and an efficient use of limited resources.

### **Screening Alternatives to Identify the Locally Preferred Investment Alternative**

Two tiers of transit alternatives were posited as ways to respond to the transportation problems of the Monterey Peninsula. The first tier included seven build rail and bus options, and a no-build alternative for comparison of benefits. Intercity rail, commuter rail, local Peninsula light rail, bus rapid transit (BRT) and enhanced bus improvements were defined, costs and potential impacts quantified, and each alternative was evaluated against a number of performance criteria linked to project purpose and need objectives. The criteria fell into several categories: relief of existing and forecast traffic congestion (roadway/intersection operations); ability to attract and efficiently move transit riders (total daily and new transit users; vehicle travel times); improve the local environment and promote smart, sustainable growth (environmental impacts); and costs relative to funding (both capital and operating). High cost alternatives and those not significantly benefiting local traffic and mobility were dropped from further consideration. This screening resulted in a second level of alternatives for further refinement and additional evaluation. These included a no-build and five build alternatives:

- **BRT-1:** Bus rapid transit from Monterey to Marina along a restored Monterey Branch Line transitway
- **BRT-2:** Bus rapid transit from Monterey to Castroville along a Monterey Branch Line transitway
- **LRT-1:** Light rail transit from Monterey to Marina on a restored Monterey Branch Line rail guideway using diesel-powered multiple unit trains (DMUs)
- **LRT-2:** Light rail transit from Monterey to Castroville on the Monterey Branch line using DMUs
- **Enhanced Bus:** Improved bus service on existing roadways from Monterey to Salinas.

The evaluation of the second tier alternatives included extensive outreach to the public, local agencies and decision-makers in addition to more detailed analysis of costs and impacts. The findings of the ridership and cost comparison between the modes are discussed below.

In the near term, LRT and BRT alternatives were found to have similar ridership potential. Average weekday boardings, including both the fixed-guideway service and supporting bus feeder service, were estimated to range from 4,300 to 4,450, with LRT-1 and LRT-2 projections slightly higher than their comparable BRT alternatives. Daily boardings on all build alternatives were approximately 80% higher than for the no-build condition and 35 to 40% higher than on the enhanced bus/transportation system management alternative.

Capital and operating costs were also found to be generally similar (within 10 percent) between comparable LRT and BRT alignments. Provision of LRT or BRT fixed-guideway service to Castroville was found to result in substantially greater capital cost (approximately \$33-\$43 million) than the shorter guideway alternatives terminating in Marina. While the enhanced bus and no-build alternatives would result in far less capital and operating costs, as noted above, project objectives would not be fully achieved due to limited ridership benefits.

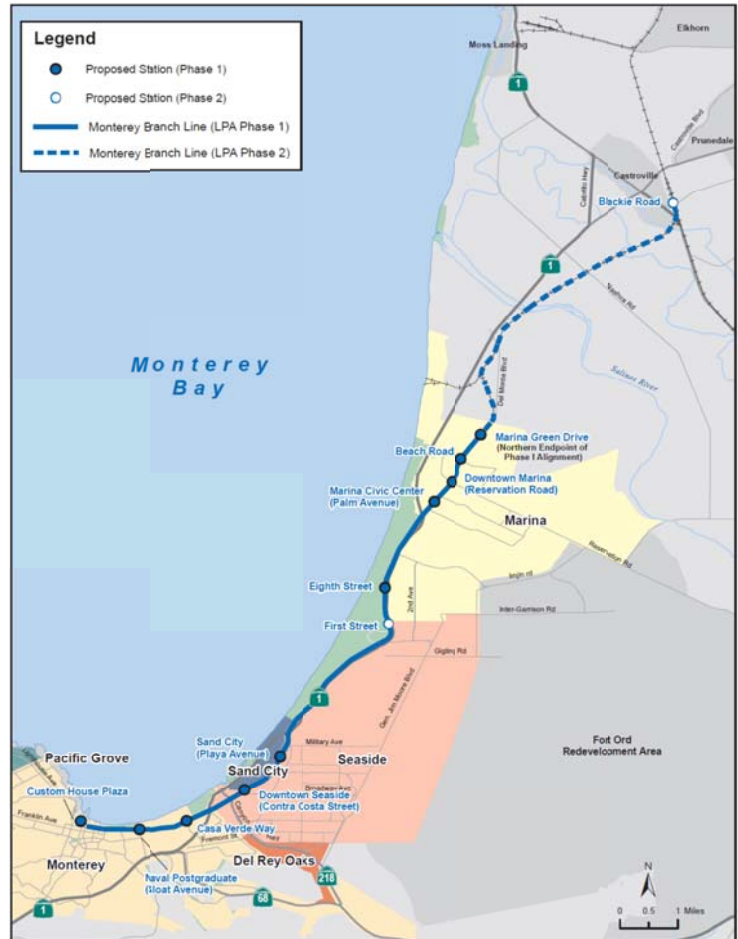
**Selection of the Locally Preferred Alternative**

The alternatives analysis process resulted in a recommendation of LRT-1 as the preferred initial investment and LRT-2 as a preferred longer term investment. On October 28, 2009, the TAMC Board of Directors in Resolution No. 2009-13 adopted phased LRT as the locally preferred alternative for the Monterey Peninsula corridor.

The locally preferred alternative is shown in **Figure A-1**. It includes 10 stations in the approximately 10-mile Phase 1 segment to Marina and an infill station and Castroville terminus station in a 5.2 mile Phase 2. Total fixed-guideway length is 15.2 miles at completion. Some modifications to LRT-1 are reflected in the locally preferred alternative, including reducing LRT frequency in the initial years of service and modifying connecting bus service in order to reduce projects costs.

Reasons for selecting phased LRT over BRT and other alternatives included:

- **Cost-Benefit:** Weighing the higher ridership potential of rail against its moderately higher initial capital cost, policy makers and the public concluded that rail is a superior long-term investment strategy.
- **Traffic, Transportation and General Mobility:** Light rail will reduce growth in single passenger automobile trips and expand intra-county travel options in the capacity constrained SR-1 corridor. Major intersection operations will improve at several critical locations relative to the no-build. Additionally, the mobility of Cal State University Monterey Bay students will be improved by providing a station close to the campus.
- **Other Environmental Impacts:** LRT has fewer adverse environmental impacts and greater environmental benefits than BRT:
  - Rail has greater potential to divert single occupant vehicle trips to high-capacity transit by attracting the choice rider.
  - Energy use and emissions per rider are lower for LRT than BRT. In the long term, light rail’s greater capacity holds more potential to reduce emissions, including GHGs and slow the growth in transportation energy consumption.
  - Rail supports efforts to promote other travel alternatives to the auto, such as bicycles and pedestrians by accommodating a greater number of bikes on-board vehicles and creating pedestrian environments around stations.
  - Light rail improves access for persons with disabilities with easy on and off boarding for those in wheelchairs, without requiring any driver assistance.



- **Long-Term Flexibility:** Rail vehicles have higher capacity than BRT vehicles and can also be linked into trains to further increase system capacity, which will be critical in the long-term given the single-tracking of a portion of the corridor and several capacity-constrained grade crossings. In addition, maintenance of rail tracks along the Branch Line corridor preserves the opportunity to one day provide intercity or commuter rail from San Francisco to Monterey.
- **Economic Impacts:** The locally preferred alternative will facilitate transit-oriented development proposed in land use plans of corridor cities. The project will also provide expanded access to employment centers and visitor/recreational facilities in and around Monterey.
- **Local Support:** Local policymaker and public support is highest for phased light rail; it has the highest potential to attract choice riders and divert auto users to transit.
- **Service Reliability and Convenience:** Rail service reliability should be the highest of all modes as it will operate entirely in segregated right-of-way and includes priority through protected at-grade crossings.
- **Financial Feasibility:** Major roadway widening is uncertain, particularly along SR-1 due to cost and environmental impacts. The locally preferred alternative was deemed financially feasible through the alternatives analysis.

Ridership for the locally preferred alternative is shown in **Table A-1** for 2015 and 2035. Capital costs for the initial phase of the locally preferred alternative are summarized in **Table A-2**.

**Table A-1**

**Locally Preferred Alternative Transit Boardings**

MODE	2015 PHASE 1	2035 PHASE 2
Light Rail	2,125	4,050
Feeder Bus Service	1,500	1,800
<b>Total</b>	<b>3,625</b>	<b>5,850</b>

Source: Parsons

**Table A-2**

**Capital Costs of Locally Preferred Alternative (Phase 1)**

TOTAL COST (BASE YEAR \$)	TOTAL COST (YOE \$)	ANNUALIZED COST (2011 \$)
\$144.350M	\$164.439M	\$11.828M

Source: Parsons

**Small Starts /Financing Plan**

The initial phase of the adopted locally preferred alternative meets the criteria FTA has established for Small Starts projects eligible for transit capital investment program (49 U.S.C. 5309) funding. The project cost would be substantially under the not-to-exceed cost threshold of \$250 million. More than 50 percent of the alignment is a dedicated transitway (“fixed-guideway”). Other project features include substantial transit stations, traffic signal priority through intersections, level-boarding of vehicles, and distinctive branding to clearly identify the service from other transit. Preliminary estimates of cost-effectiveness demonstrate the locally preferred alternative initial phase should meet FTA’s objective for project incremental annualized cost (capital and operating) relative user benefits. The cost effectiveness ratio is \$21.83, or within the medium rating breakpoints (which range from \$16.50 to \$24.99 for FY 2012 Small Starts project evaluations).

TAMC proposes to request up to \$75 million in Section 5309 Small Starts funding to complement local and state sources of capital funds for a project. Other sources are proposed to include, but not be limited to, State Transportation Improvement Program funds (\$9 million); other State of California transportation funds (\$57.2 million); Fort Ord Military Base Reuse and other development fees (\$16.4 million); and other local funds (\$6.8 million). The funding sources are in year of expenditure and total \$164.4 million.

The project is anticipated to result in an increase of \$3.66 million in bus operating costs. TAMC has identified a number of local funding sources to fully offset this cost, such that the project would not require a reduction in transit services in other areas.



## 1.0 Introduction and Background

This Summary Report highlights the findings of the recently performed Alternatives Analysis for the Monterey Peninsula Fixed-Guideway corridor. It contains a summary of both the *Alternatives Analysis Volume 1: Final Alternatives Analysis Report* (published December 2008, revised December 2009) and *Alternatives Analysis Volume 2: Locally Preferred Alternative* (published February 2011). The referenced documents provide extensive detail regarding the process the Transportation Agency for Monterey County (TAMC) followed to identify a preferred transportation investment strategy for the study corridor. It includes a description of outreach efforts to obtain public and agency input on the purpose and need for transit improvements and results of the technical evaluation of the various project alternatives considered. The evaluation focused on the operations, costs and environmental impacts associated with each of the alternatives analyzed. This document summarizes those findings in a concise manner and presents the most critical information used to select the preferred transit investment strategy for the study corridor, designated the locally-preferred alternative. In particular, operating costs and sources will be highlighted in this document. The designated locally-preferred alternative will not threaten existing funds. There are several options for funding, for which TAMC will continue to coordinate with the operator, Monterey Salinas Transit (MST), who has written a support letter for the project. For more information on operating costs and funding estimates see sections 6.6.3 and 6.6.4 of this summary. For further detail on any of the contents of this summary, please refer to the Volume 1 and Volume 2 reports.

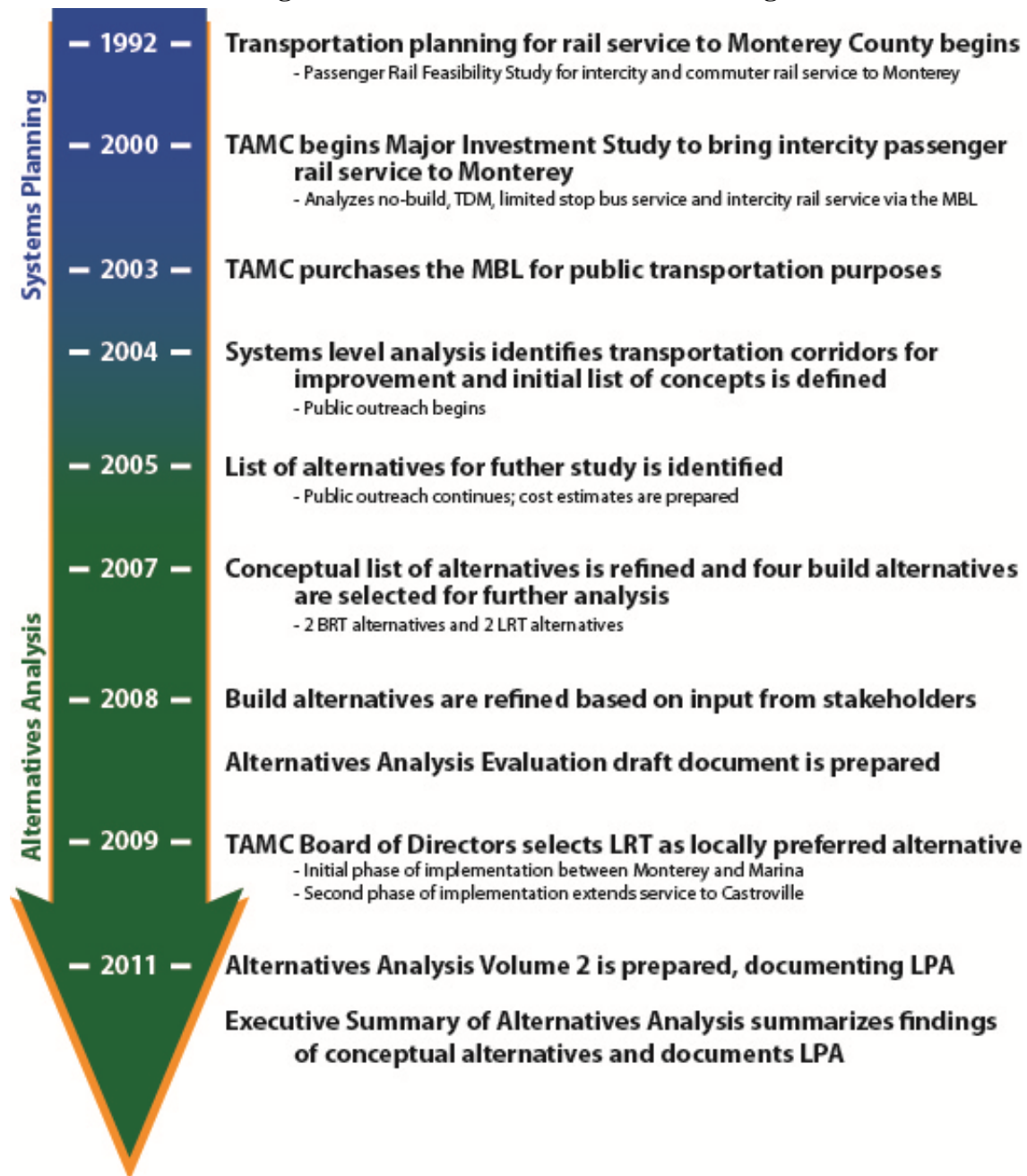
An alternatives analysis study evaluates appropriate transportation service mode and alignment options to address mobility issues in a particular transportation corridor. The study provides information to local officials on the benefits, costs, and impacts of the alternative transportation investments developed to address needs identified within the corridor. An alternatives analysis is also required if a project is to qualify for federal Section 5309 New Starts capital funding.

The purpose of this introduction is to place the development of the locally-preferred alternative into historical perspective and to show how a foundation was established for advancing a project critical to Monterey County's future through the Federal Transit Administration's (FTA's) project approval process. The discussion begins with an overview of the systems planning studies that identified the Monterey Peninsula corridor as a priority for transportation investment within Monterey County and the reasons for choosing transit over highway improvements. Subsequent sections of this document describe the alternatives development and evaluation process for the alternatives analysis. Based on the evaluation of alternatives, local decision makers selected phased light rail transit, from Monterey to Marina to Castroville as the locally-preferred alternative. The basis of this decision is documented in Section 5.7 of this document.

### 1.1 Systems Planning

A number of studies to define potentially viable fixed-guideway service in Monterey County, including the Monterey Peninsula Corridor, among other transportation corridors, have been undertaken by various agencies, stretching back at least two decades. A summary of these efforts, through the current project status, is depicted on **Figure 1-1**.

**Figure 1-1: Timeline of Corridor Planning**



System-wide analyses have determined that traffic congestion needs are two-fold. First, public transportation improvements are sought that will accommodate a portion of existing inter-county commute-oriented traffic and provide residual capacity for future travel demand increases. Relatively heavy volumes of commuter traffic are generated between Monterey and neighboring Santa Cruz and San Benito counties. Additionally, there is substantial traffic to and from the San Francisco Bay Area (Santa Clara County, San Francisco County, and San Mateo County) associated with both visitors and commuters. This trip demand generates congestion in two primary transportation corridors, defined by the two major north-south roadways through Monterey County: Highway 101 (US-101) and State Route 1

(SR-1). The major connecting roadways between the two corridors also become congested during peak travel periods, which include weekday commuter hours and weekend afternoons and evenings when recreational traffic is high. This travel demand, referred to as inter-county travel, is associated with long trip lengths, one trip end outside of the County and fairly well defined periods of demand.

The second source of traffic congestion is generated by local travel, referred to as intra-county travel. Local trips predominately occur between Monterey Peninsula cities and between the Monterey Peninsula and Salinas. This type of trip-making is associated with a variety of trip purposes, including local commute, business, educational, and shopping trips, and includes trips throughout the day, including both commute periods and off-peak travel periods. These intra-county trips occur on already congested roadways, including the same roadways that serve inter-county travel, such as SR-1 and the major cross-connectors between SR-1 and US-101. This traffic demand is referred to as intra-county travel.

Opportunities to expand highway capacity for either inter-county or intra-county travel are limited by environmental constraints and uncertain funding, even for already approved projects. System-wide planning studies concluded that suitable public transit investments are needed to facilitate travel within and to and from Monterey County in a cost-effective manner, thereby complementing the highway investment proposals also included in the Monterey County Regional Transportation Plan.

The key transportation corridors for each of the public transportation needs are depicted in **Figure 1-2**.

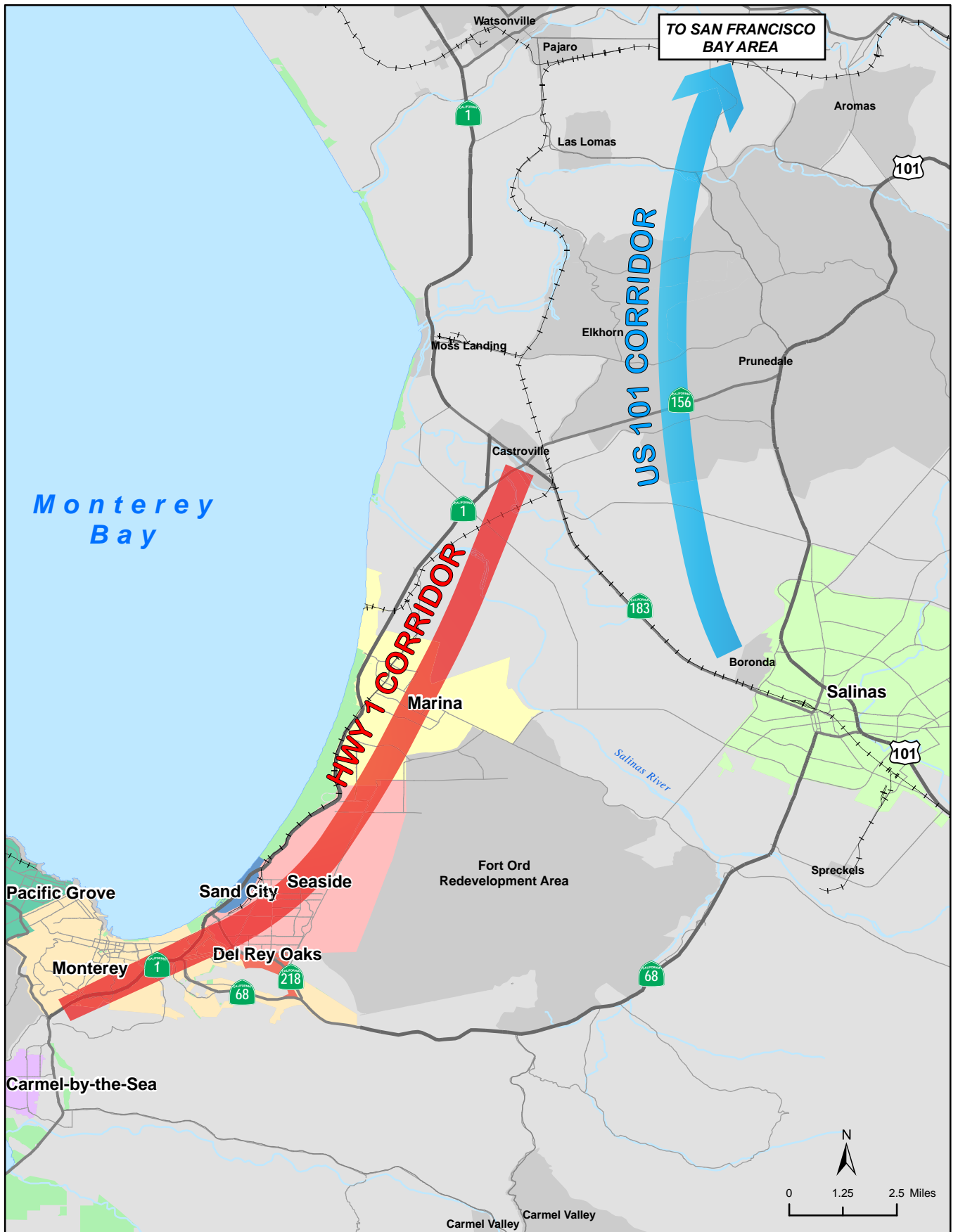
### ***1.1.1 Systems Planning Alternatives***

The two Monterey County transportation needs were determined to require separate but interrelated solutions given the unique trip patterns. Furthermore, in the face of limited funding for large-scale investment projects, solutions were needed that provide safe, effective, and efficient transportation facilities for commuters, visitors, and through traffic and, at the same time, reduce current and projected congestion.

A candidate pool of conceptual transit alternatives was developed to address mobility problems and other transportation concerns in the county, concentrating on addressing the growing congestion problems in the US-101 and SR-1 corridors. The initial set of conceptual alternatives was structured to provide a range of multi-modal transportation infrastructure and service improvements and a range of levels of investment to address the variety of transportation needs in the County. Included in the initial alternatives was a baseline alternative (No. 0), which assumed there was no new major transit capital investment, and eight various build alternatives, which may include major investments in bus and/or rail transit technologies. The conceptual alternatives considered included:

- 1. *No-Build:*** Existing transit services and limited roadway improvements
- 2. *Commuter Rail to Salinas:*** Extend 4 commuter rail round trips from Gilroy to Salinas
- 3. *Monterey Peninsula to San Francisco Intercity Rail Service:*** Operate 2-3 intercity train round trips between Monterey Peninsula and San Francisco
- 4. *Monterey Peninsula to San Francisco Intercity Rail Service Plus Commuter Rail to Salinas and Monterey Peninsula:*** Operate intercity service to San Francisco and extend 2 commuter rail round trips from Gilroy to Salinas and two round trips from Gilroy to Marina





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FIGURE 1-2

TRANSPORTATION IMPROVEMENT CORRIDORS

5. ***Monterey Peninsula Shuttle to Castroville Commuter Rail Service: Extend 4 commuter rail roundtrips from Gilroy to Salinas;*** connecting shuttle from Seaside to commuter rail service extension.
6. ***Local Monterey Peninsula Light Rail Transit (LRT) or Bus Rapid Transit (BRT) Service: Construct LRT or BRT guideway between Monterey and Marina or extend LRT to Castroville. Includes commuter rail service to Salinas.***
7. ***Salinas to Monterey Local Rail or BRT Service:*** Construct LRT or BRT guideway between Monterey and Marina; extend LRT to Castroville via Monterey Branch Line and to Salinas along Coast Mainline; or extend BRT guideway to Salinas. Includes commuter rail service to Salinas.
8. ***Monterey Peninsula to San Francisco Intercity Rail plus Salinas to Monterey Local Rail Service:*** Construct LRT between Monterey, Castroville, and Salinas; operate intercity rail service from Monterey to San Francisco, both services using FRA-compliant diesel-multiple units. Includes commuter rail service to Salinas.
9. ***Enhanced Local Bus plus Monterey County to San Francisco Peninsula Express Bus Service (transportation system management improvements):*** Low cost transit investments to match locally preferred build alternative and construct major roadway construction to address congestion.

All alternatives but the No-Build and Enhanced Local Bus included the extension of commuter rail or intercity rail service at least between Gilroy and Salinas or Monterey. The LRT and BRT alternatives that proposed improvements in the SR-1 corridor between Monterey and Castroville (Nos. 5, 6 and 7) also assumed connecting to the commuter rail extension to Salinas to enhance access between the Monterey Peninsula and the Bay Area.

The systems planning effort recommended further study of the eight alternatives listed above, although split into two analyses, segregated by the primary corridor and type of trip served.

### ***1.1.2 Recommended Alternatives for Addressing Inter-County Travel***

The preferred alternative for addressing growing inter-county travel and congestion was the extension of commuter rail service from Gilroy to Salinas, which essentially follows the US-101 alignment and would thereby expand commuter mobility options in that roadway corridor. This is Alternative 1 in the above list. The proposed project actually consists of four elements:

- Commuter rail stations within the communities of Pajaro and Castroville
- Renovations/expansions of an existing passenger rail station and construction of a new parking facility at Salinas
- Construction of a commuter rail layover facility at Salinas.
- Improvements to the Union Pacific Railroad (UPRR) Coast main line between Gilroy and Salinas

The project is proceeding through the next phases of approval and design definition. An alternatives analysis was completed in April 2007. The preliminary design of the project has also been completed and a draft California Environmental Quality Act Environmental Impact Report (EIR) prepared. The Draft EIR circulated for public review on April 26, 2006. The project will seek National Environmental Policy

Act (NEPA) clearance as well in the form of an Environmental Assessment, a draft of which is to circulate for public review later in 2012.

Complementary improvements to a service extension have proceeded, including a multimodal transportation center at the Salinas Amtrak station and site assessments for passenger rail stations in Pajaro and Castroville.

Thus, the recommended transit investment strategy in the US-101 corridor continues to advance.

### ***1.1.3 Recommended Alternatives for Addressing Intra-County Travel***

The systems planning analysis determined that local service on the SR-1 corridor, in combination with inter-county service from Monterey County to the Bay Area would be best fit to help alleviate existing and forecast congestion on county highways. Local, high-quality transit service along the Monterey Peninsula, either light rail transit (LRT) or bus rapid transit (BRT), would complement, through an interface in Salinas or Castroville, the commuter rail service extension to Salinas, a separate project discussed above. Because the commuter rail service extension to Salinas along the US-101 corridor is already part of the proposed project to address inter-county travel, alternatives for further analysis should focus capital improvements for intra-county travel. This includes improvements in the SR-1 corridor, with supplementary bus service enhancing connections between activity centers in the Monterey Peninsula and Salinas.

The implementation process for LRT or BRT guideway service along the Monterey Peninsula Corridor is not as advanced as the proposed commuter rail service from Gilroy to Salinas. However, based on the findings of an investment study initiated in 2000, TAMC purchased the Monterey Branch Line from the UPRR in September 2003 using Proposition 116 state rail bond funding. Use of the branch line for public transportation is conditioned on certification of the California Environmental Quality Act and National Environmental Policy Act environmental documents.

The following sections of this document describe the various steps in the definition and evaluation of transportation improvement alternatives that primarily address intra-county travel needs within the Monterey Peninsula.

## 2.0 Project Setting

The study area covered by this report is, in general, the Monterey Peninsula/Salinas/Castroville area, but affects residents of and visitors to Monterey County as a whole. The transportation corridor within the study area is predominately centered on the old UPRR line, known as the Monterey Branch Line. The Monterey Branch Line right-of-way stretches approximately 16 miles between Downtown Monterey and Castroville, and also passes through the cities of Seaside and Sand City (see **Figure 2-1**). For purposes of this study, “the corridor” refers to the Monterey Branch Line corridor as defined above.

### 2.1 Monterey Peninsula Land Uses

The Monterey Peninsula area, especially the land area very near the coastline, supports one of two major development concentrations in Monterey County (City of Salinas being the other) and encompasses the area from Carmel, Pebble Beach, Pacific Grove and Monterey to Marina—including Seaside, Sand City, and Del Rey Oaks. Concentrated development activity occurs predominately along the Monterey Branch Line right-of-way and along the SR-1/Del Monte Avenue corridor. This major transportation corridor has shaped and supported local development since the earliest days of settlement.

Tourism has traditionally been the major employment generator on the Monterey Peninsula, particularly since closure of the former Fort Ord military base facility in 1989. The Peninsula draws thousands of visitors annually to attractions such as the Monterey Bay National Marine Sanctuary and Monterey Bay Aquarium, Cannery Row, artist and coastal activities in Seaside, Sand City, and Marina, and several coastline beaches and resort facilities which support a multi-billion dollar industry. The area also provides large numbers of jobs in commercial-related employment, Defense Department activities, and educational institutions including California State University–Monterey Bay, the Naval Postgraduate School, Monterey Peninsula College, and the Monterey Institute for International Studies.

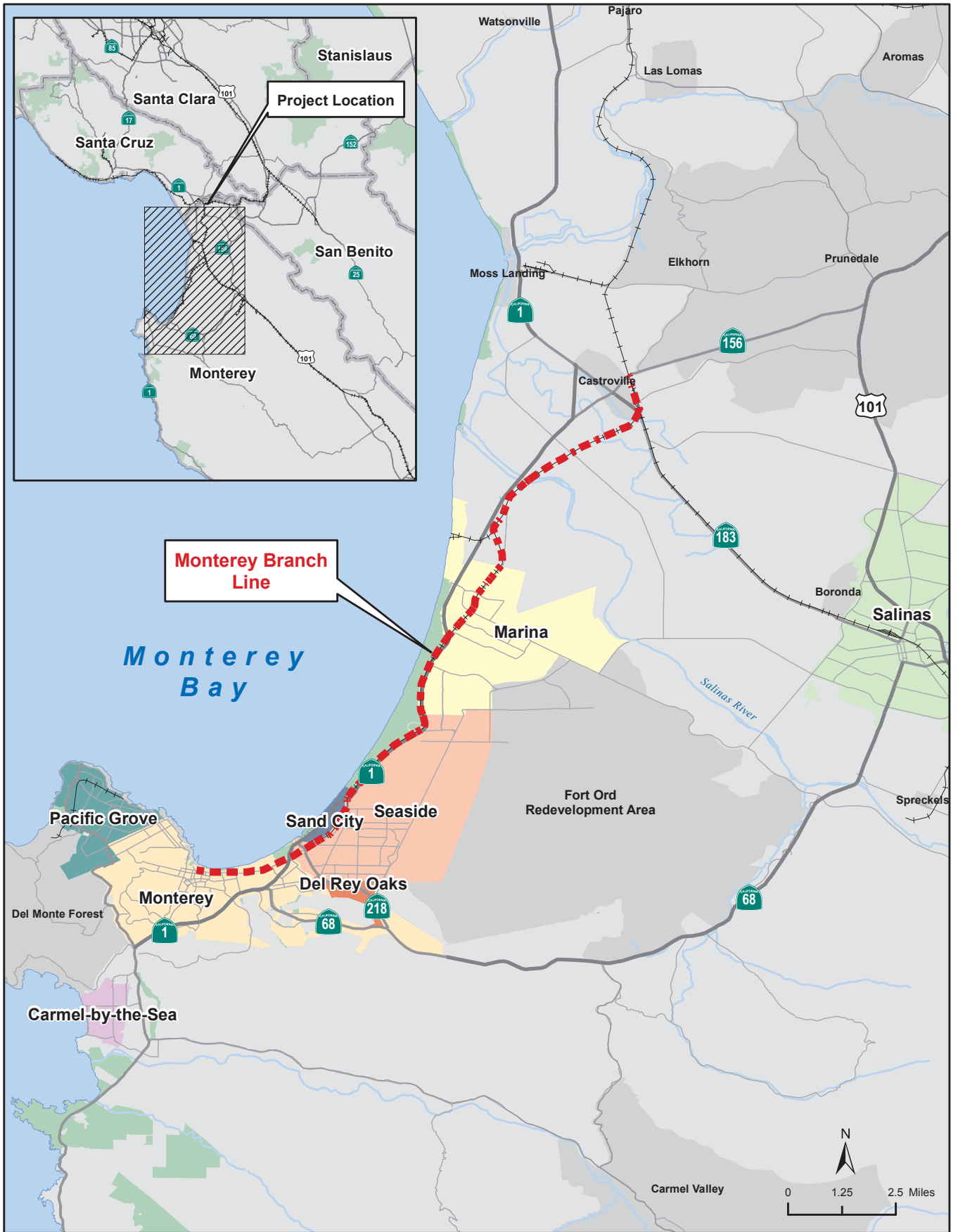
A deep concern and respect for coastal and inland environmental issues and environmental protection are part of the local fabric and mandated by federal, state, county, and Monterey Peninsula city agencies. The Monterey Peninsula cities, in particular, have long held that development proposals will not be approved without the inclusion of effective and enforceable environmental controls. The proposed project is expected to limit greenhouse gas emissions to a level less than that expected from the single occupant vehicles it will replace.

Each of the cities in the Monterey Peninsula has adopted zoning and planning policies and requirements that support transit-oriented land use and transit service. For a description of those specific policies and planned developments in each of the cities, refer to *Alternatives Analysis Volume 1, Chapter 3*.

### 2.2 Monterey Peninsula Demographics

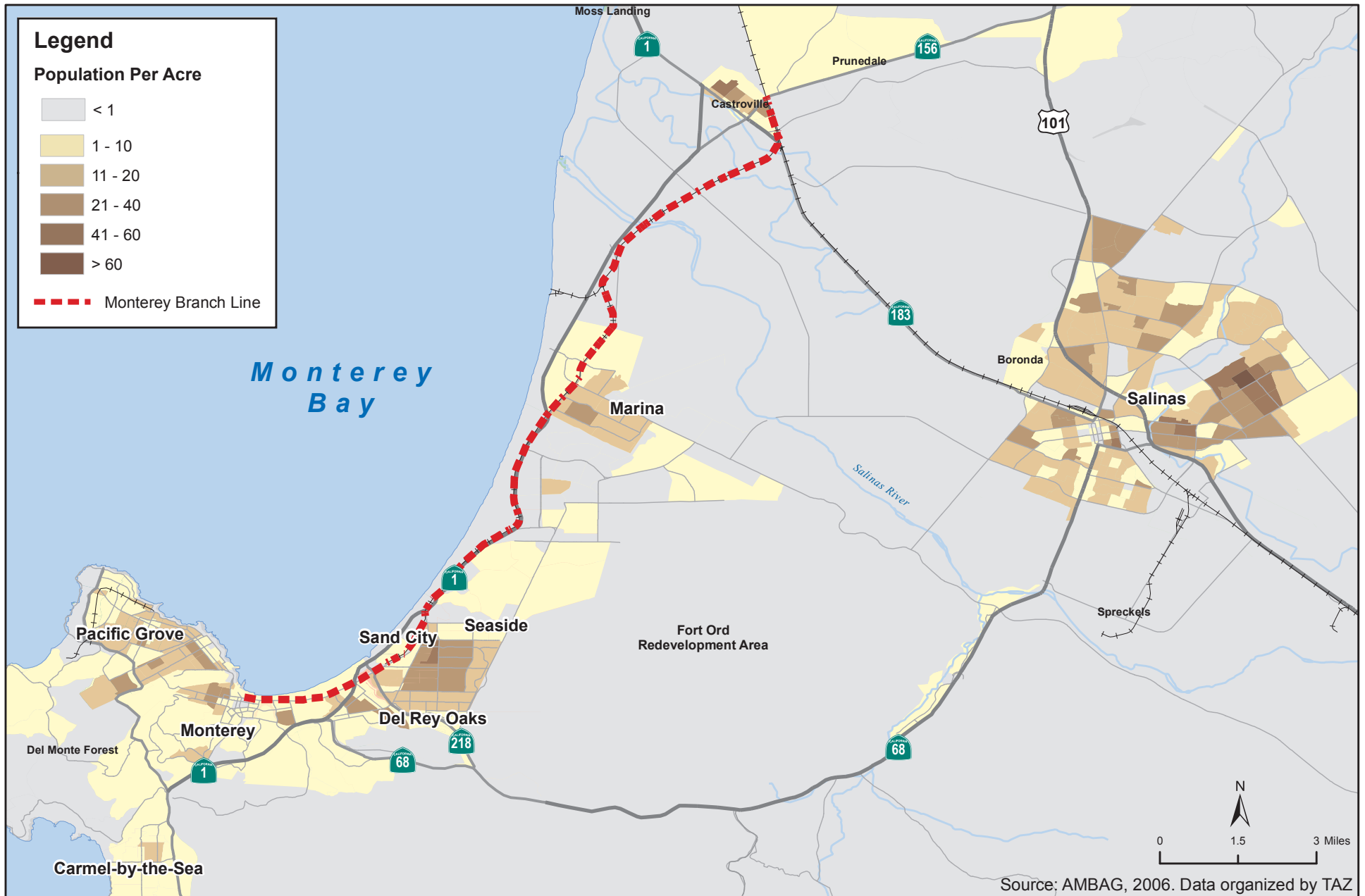
Existing population and employment densities in the study area are illustrated in **Figures 2-2** and **2-3**, respectively.





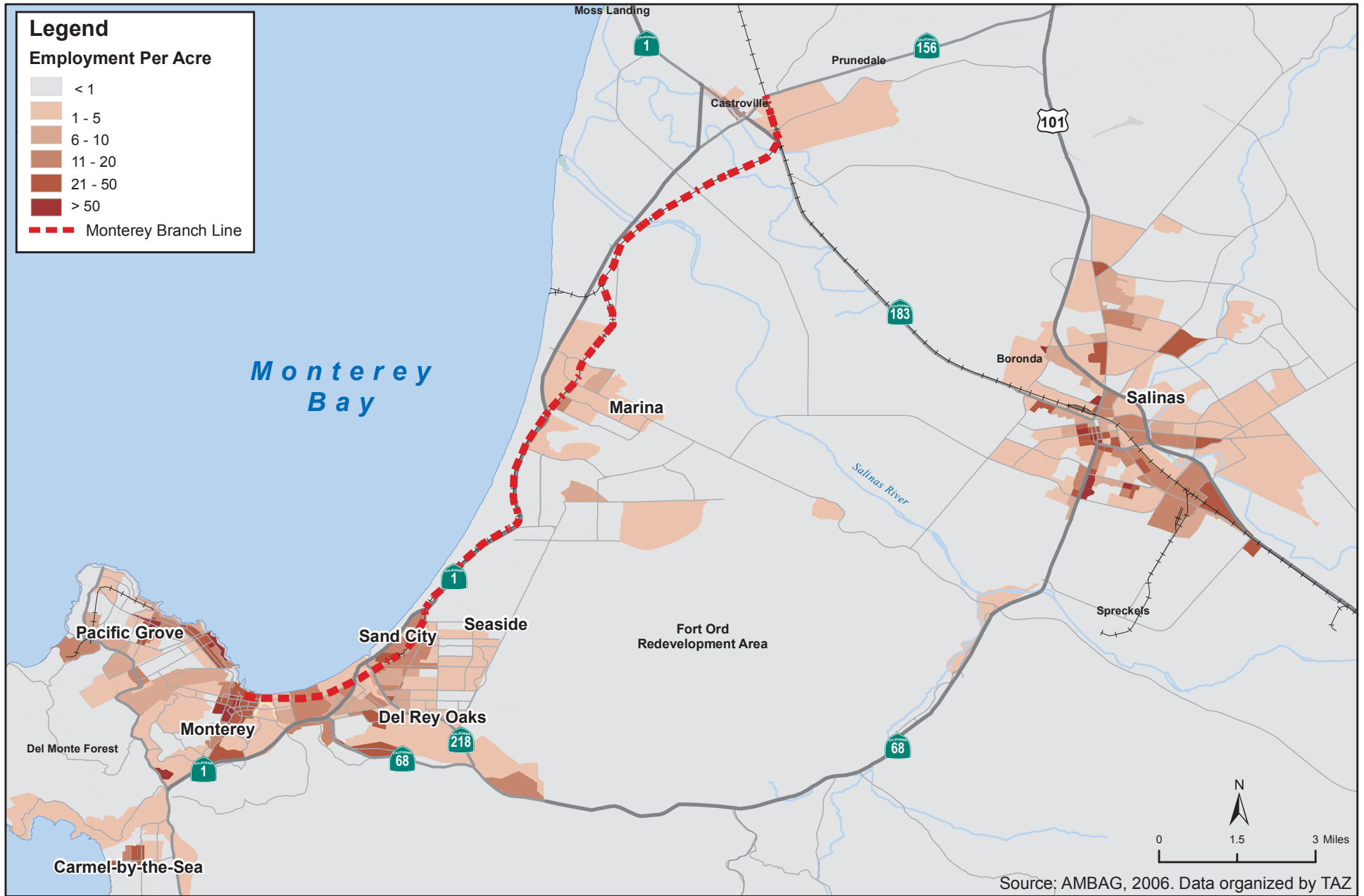
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FIGURE 2-1  
STUDY AREA



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FIGURE 2-2  
EXISTING POPULATION DENSITY



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FIGURE 2-3  
EXISTING EMPLOYMENT DENSITY

The Association of Monterey Bay Area Governments (AMBAG), in its role as the federally designated Metropolitan Planning Organization, prepares regional housing, population and employment forecasts for the region. These forecasts are integrated into the regional travel demand model, which assists in the identification and prioritization of regional transportation improvements. AMBAG projected population and employment growth between 2006 and 2030 is shown in **Figure 2-4**.

**Table 2-1** compares the AMBAG growth forecast for 2006 to 2015 to city approved, entitled, and/or specific plan estimates of housing and employment increases, as of 2008. In other words, shovel-ready housing entitlements could more than double (255 percent increase) the amount of new housing added to the peninsula as soon as market conditions permit, compared to the AMBAG forecast. Employment growth could be seven times greater than forecast, based on approved development plans. In Marina, for example, more than 1,000 jobs were added between 2006 and 2008 to sites adjacent to the branch line, far exceeding the growth in employment forecast by AMBAG for the 2006 to 2015 time period. The efficient investment in transportation facilities is crucial to the area’s future, as there is currently insufficient highway capacity to mitigate the increased traffic demand associated with already approved and entitled development projects.

**Table 2-1**  
**Monterey Peninsula Housing and Employment Forecast Growth (2006–2015)**

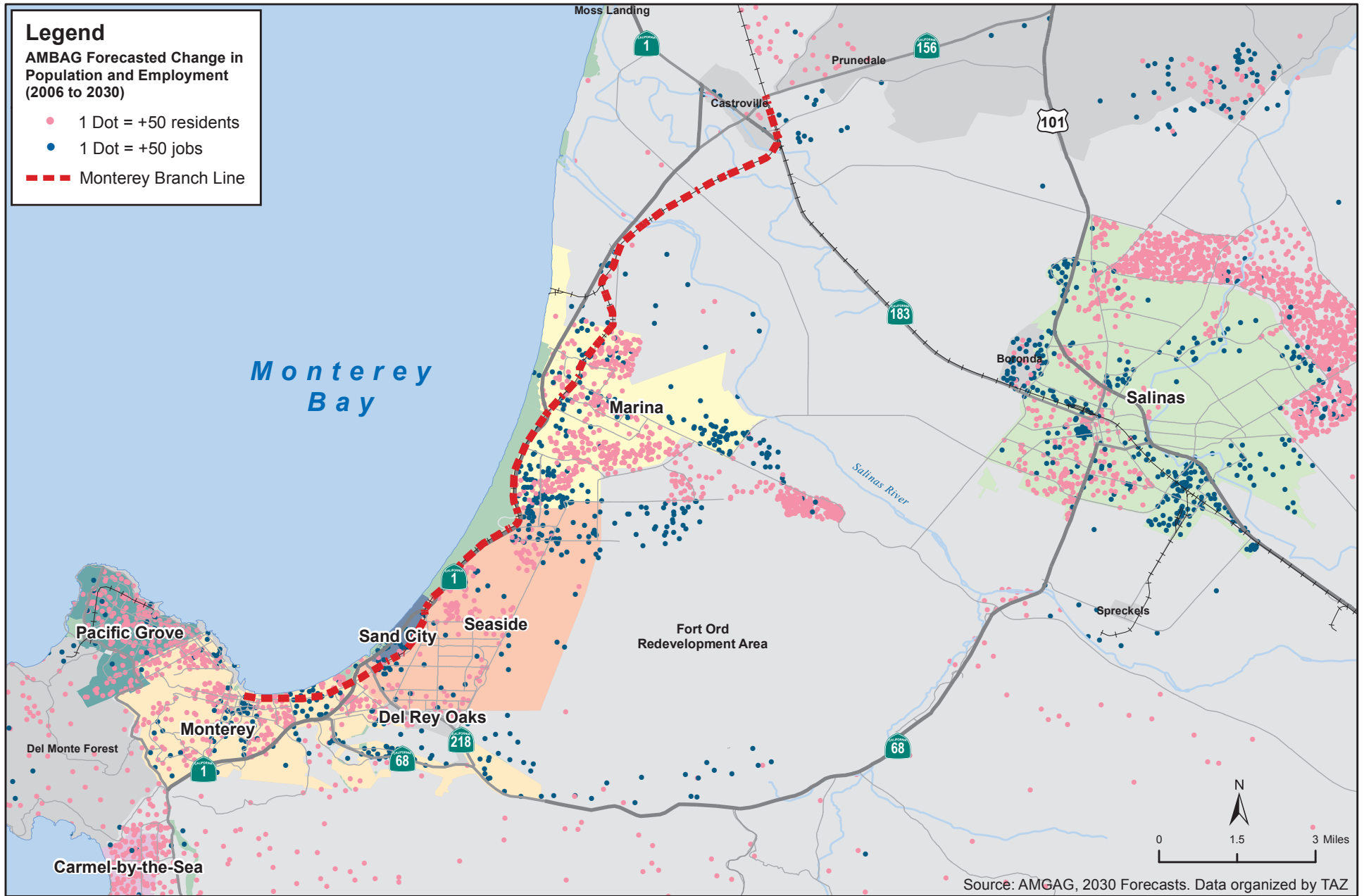
CITY	HOUSING UNIT GROWTH		EMPLOYMENT GROWTH	
	AMBAG FORECAST	CITY APPROVED	AMBAG FORECAST	CITY APPROVED
Marina	2,027	5,273	400	11,378
Seaside	327	1,545	952	4,009
Sand City	564	564	410	1,707
Monterey	186	551	1,882	8,362
<b>TOTAL</b>	<b>3,104</b>	<b>7,933</b>	<b>3,644</b>	<b>25,456</b>

*Source: Parsons, City of Marina, California State University–Monterey Bay, City of Seaside, City of Sand City, Presidio of Monterey, Community Hospital of the Monterey Peninsula*

Given the precarious nature of demographic forecasting, the growth in corridor travel demand could easily outpace the official AMBAG forecasts upon which transportation investment decisions are based, resulting in very conservative ridership projections.

Planned development projects along the study area corridor are illustrated in **Figure 2-5**.



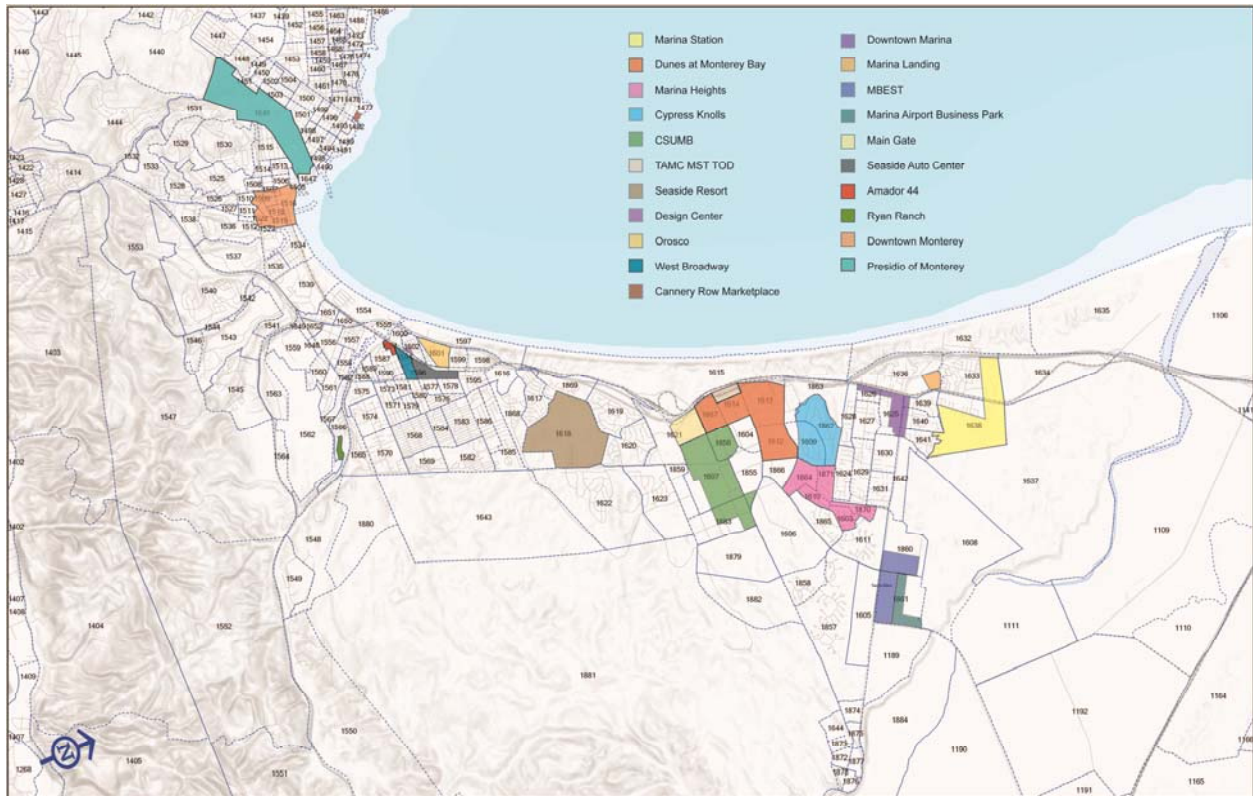


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FIGURE 2-4

AMBAG PROJECTED POPULATION AND EMPLOYMENT GROWTH

**Figure 2-5: Planned Development Projects in Study Area**

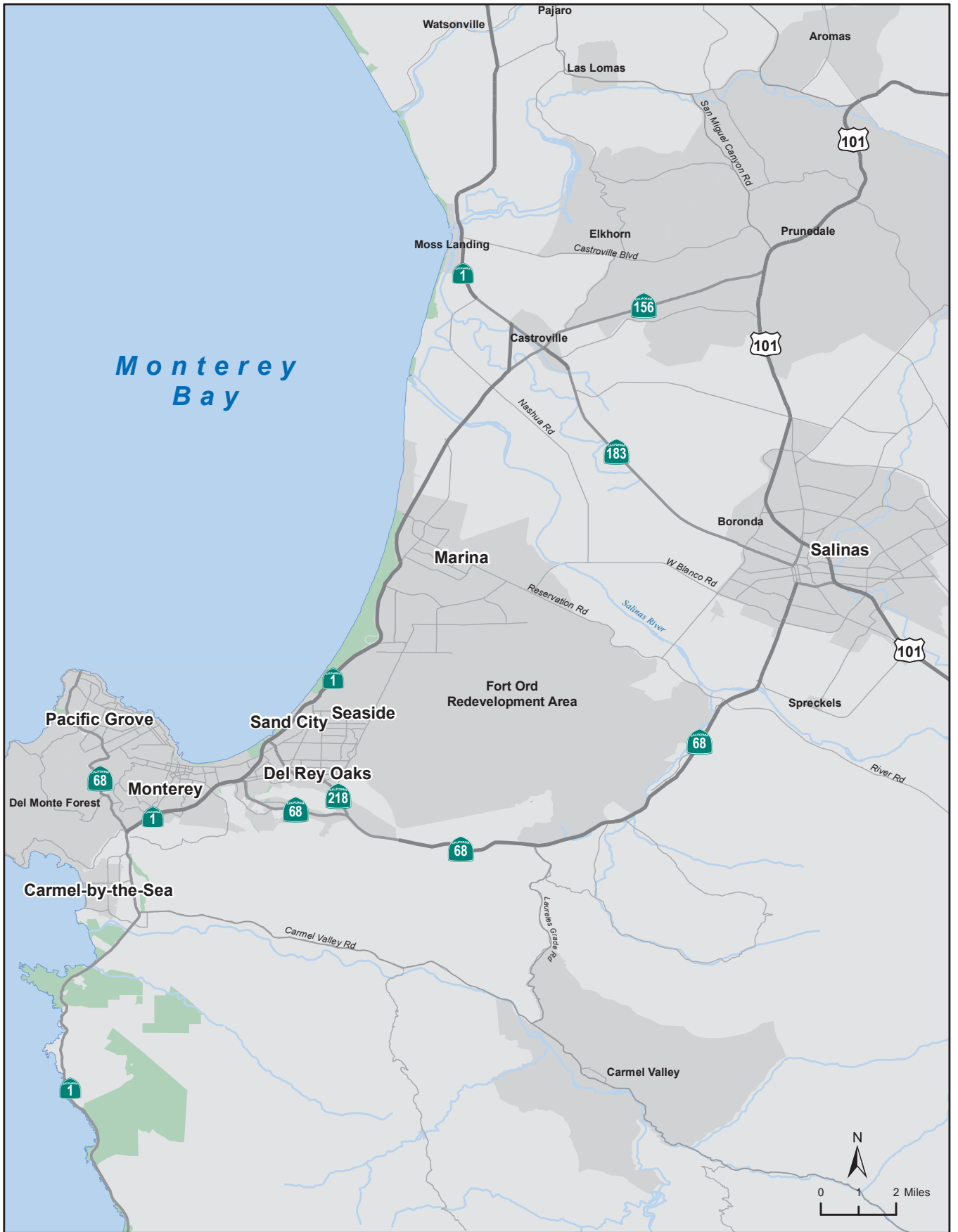


### 2.3 Trip Patterns

Monterey County’s existing multi-modal transportation network consists of extensive roadways, an intercity rail line, and public transportation fixed and variable bus routes. In general the Monterey Peninsula transportation network primarily serves residential, tourism, educational and commercial uses, with industrial uses associated with agriculture occurring primarily in the Salinas area. In 2005, an estimated 1.6 million daily person trips originated within Monterey County. Projections out to 2035 show an anticipated 17 percent increase in daily person trips. The modal distribution of the total daily person trips is currently dominated by personal automobiles. Personal automobiles in year 2005 accounted for 88 percent of all trips, with non-motorized modes and transit accounting for 10 percent and 2 percent, respectively.

Home-based work trips were under-represented on transit compared to other trips. This is likely due to the lack of competitive transit options for many commuters.

The regional roadway network is illustrated by **Figure 2-6**. Traffic flows are heaviest along SR-1, US-101, SR-68, SR-156 and SR-183, and local roads such as Blanco Road, Reservation Road, Del Monte Avenue and Boulevard, and Lighthouse Avenue.



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FIGURE 2-6  
EXISTING ROADWAY NETWORK

As shown in **Figure 2-3** (back), the region's main employment centers are in Monterey and Salinas. However, residential areas are strung along the Monterey Bay between Carmel to the south and, generally, Marina to the north. Therefore, commute traffic is primarily along SR-1 and parallel surface streets as well as east on SR-68 and along major arterials in Salinas. Daily commute traffic, combined with regional inter-county commute and tourism trips, and agricultural freight trips result in significant existing congestion on these corridors during peak periods. Even with improvement projects outlined in the Regional Transportation Plan for SR-1, the highway is anticipated to continue operating above capacity. The majority of the growth in traffic on SR-1 is anticipated to be from trips originating either on the Monterey Peninsula or in Salinas. In 2000, trips originating or ending outside of the county accounted for nearly 12 percent of the trips on SR-1; this percentage is anticipated to decrease to 4 percent by 2030 as local trip generation increases and the roadway capacity is further strained.

## 2.4 Transit Network

Monterey–Salinas Transit (MST) serves a 275-square mile area of Monterey County and southern Santa Cruz County. An estimated 352,000 people live within 0.75 miles of Monterey County transit routes.

MST's 33 routes provide service primarily in the Monterey Peninsula's urban areas and in the Salinas Valley. Intercity service between these two urbanized areas of Monterey County is provided via SR-68 and SR-1. In addition, intercity routes connect MST with the Santa Cruz Metropolitan Transit District at a transit center in Watsonville. MST also provides rural transit service to Carmel Valley, both weekend and daily seasonal service to Big Sur, and bus trolley service along the Monterey-Pacific Grove waterfront. The existing transit network is shown in **Figure 2-7**.

Ridership on MST's 15 Monterey Peninsula routes averages 7,516 passengers per weekday. Line 20, which serves the corridor along Del Monte Boulevard, has the highest number of weekday boardings of any of these routes. The distribution of ridership by route is depicted in **Figure 2-8**.

Bus stop boarding locations on the Monterey Peninsula are shown on **Figure 2-9**. The highest ridership activity areas are in downtown Monterey, New Monterey, at Edgewater, and along Fremont Street and Broadway in Seaside.

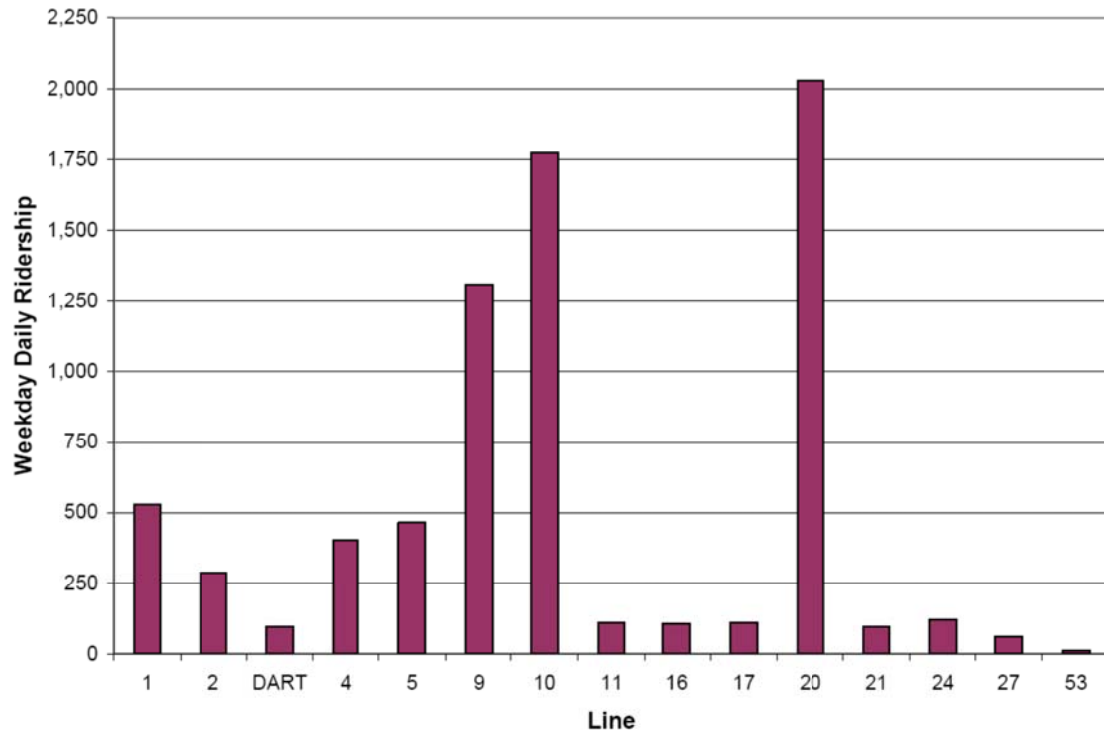


**Figure 2-7: Existing Transit Network**

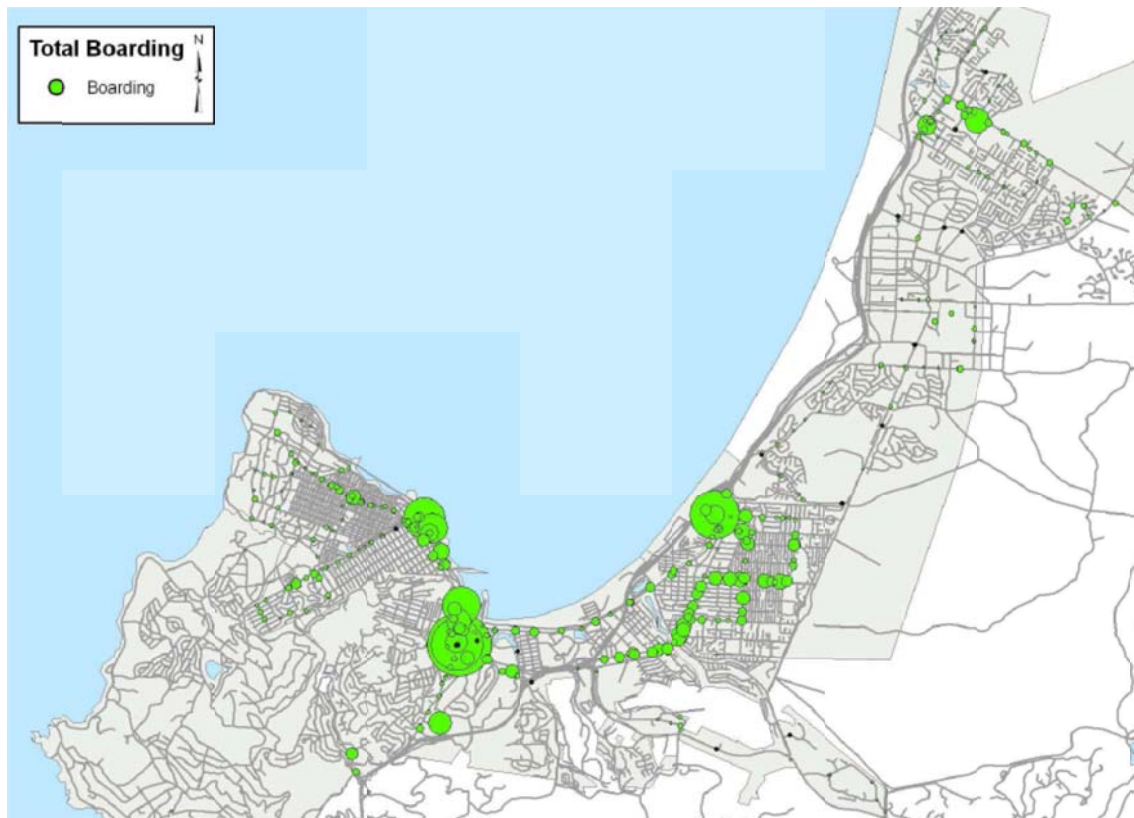


Source: 2006 Short-Range Transit Plan, MST, 2006

**Figure 2-8: Average Weekday Riders, by Line, March 2006**



**Figure 2-9: Bus Stop Level Boardings on the Peninsula**



Source: MST and Parsons

MST’s Peninsula fixed-route service operates a total of approximately 341 vehicle revenue hours each weekday, 264 vehicle revenue hours (77 percent of the weekday total) on Saturday, and 147 vehicle revenue hours on Sunday (43 percent of the weekday total). Line 20 provides the most service weekdays (68.5 revenue hours), Saturday (58 revenue hours), and Sunday (23 revenue hours). **Table 2-2** details the monthly service statistics by route.

**Table 2-2**  
**MST Peninsula Area Service Summary, March 2006**

LINE	REVENUE MILES	REVENUE HOURS	PASSENGERS
1	7,642	738.3	15,779
2	5,082	494.2	7,694
DART	8,124	819.9	2,344
4	7,334	662.0	12,179
5	5,930	545.5	13,670
9	9,567	1,004.2	37,591
10	11,221	1,147.4	49,704
11	1,135	78.5	3,514
16	7,699	477.0	2,592
17	7,660	482.7	2,987
<b>20</b>	<b>36,904</b>	<b>1,899.5</b>	<b>56,792</b>
21	3,487	210.1	2,245
24	10,339	443.5	3,377
27	7,935	348.1	1,426
53	4,421	132.8	375

Source: MST, March 2006 Operations Summary Report

**Figure 2-10** provides the line profile for Route 20, the local bus route which would be replaced wholly or in part by the proposed fixed-guideway project. **Figure 2-11** illustrates the boarding activity pattern for Route 20.

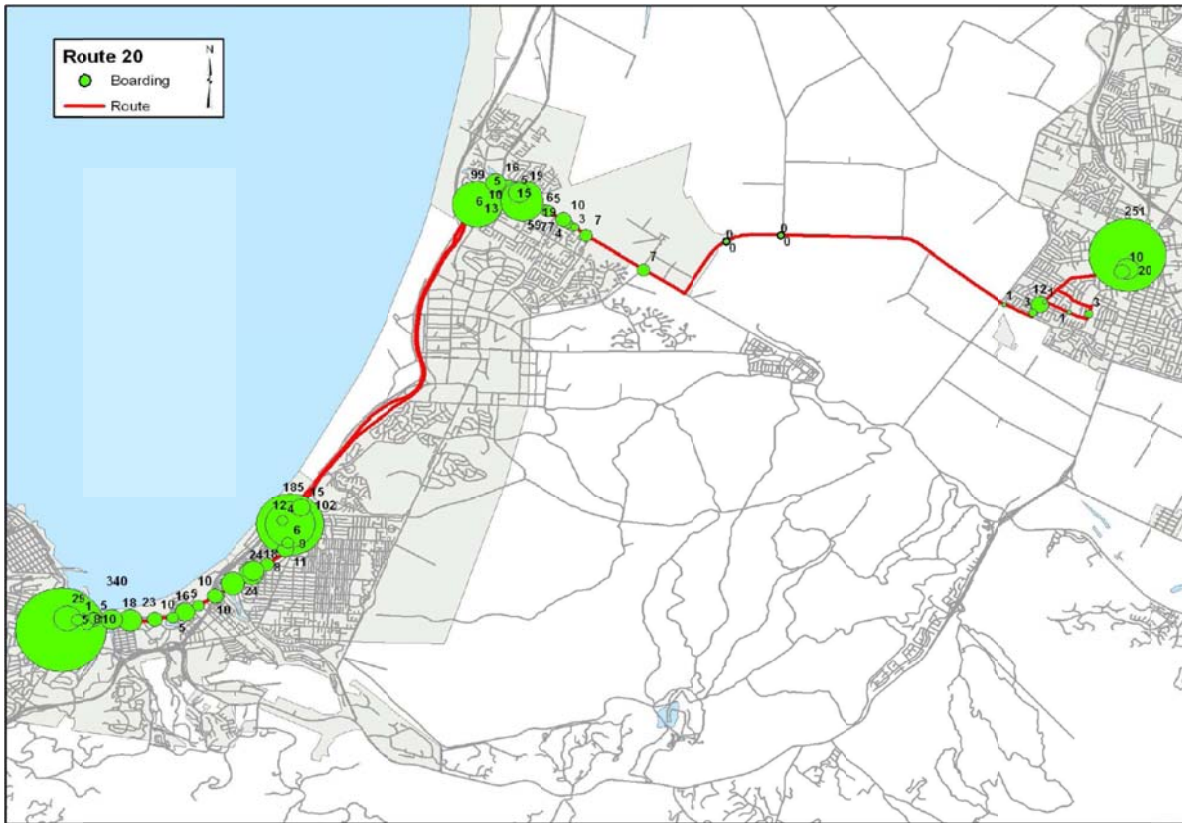
**Figure 2-10: Route 20 Profile**



Source: 2006 Short-Range Transit Plan, MST, 2006



**Figure 2-11: Line 20 Weekday Ridership Activity Distribution**



Source: 2006 Short-Range Transit Plan, MST, 2006

Monterey Salinas Transit (MST) is currently undertaking several major planning and development projects. A new Monterey Bay Bus Operations and Maintenance Center is being planned, which will bring maintenance, operations and administration facilities together on one site. This center is planned for a 24.3 acre site within the former Ford Ord area. MST is also in the FTA Very Small Starts process for a BRT service along Fremont Boulevard and Lighthouse Avenue, connecting Monterey, Sand City and Seaside. The BRT service would provide queue jumpers, transit signal priority, increased stop spacing and improved frequency to improve transit travel times. Service is anticipated to be operational in 2012.

### 3.0 Transportation Problem Statement

Several major transportation problems were identified while considering the project's purpose and need—each requiring solutions ensuring that mobility, environmental quality and economic vitality are maintained along the Monterey Peninsula. The corridor's transportation problems include significant congestion and deteriorating roadway operations, a lack of competitive alternatives to the private automobile, physical constraints on existing transit operating speeds and capacity, the need for general improvement in providing efficient mobility for low-income residents, and the need for transportation infrastructure to serve areas of growth and development through a transit-oriented development process. In short, transportation improvements have failed to keep pace with the area's recent growth, and currently planned improvements will not be adequate to address anticipated future growth.

#### 3.1 Transportation Purpose and Need

Transportation service provision within northern Monterey County is at a critical juncture. The demand for additional transportation facilities is growing in the face of increasing population, housing, and an expanding job market, while the ability to provide these facilities is severely challenged due to a lack of available funding. There are currently more than \$1.2 billion in related highway projects planned through the year 2030 as part of TAMC's long-range Regional Transportation Plan. Most of the funding for these much needed projects was expected to come from the allocation of State Transportation Improvement Program (STIP) funding and from local sales tax revenues. The current climate with respect to the states' budget crisis and the lack of a local sales tax leaves funding for these highway projects uncertain. Lower cost, higher capacity transit modes, such as rail or BRT, warrant consideration as alternative means for meeting future mobility needs.

In addition, the relationship between environmental requirements and the availability of federal funding must also be considered in light of the governor's September 2008 signing of Senate Bill (SB) 375. SB375 requires the regional governing bodies in each of the state's major metropolitan areas to adopt a "sustainable community strategy" that will meet the region's target for reducing greenhouse gas (GHG) emissions. These strategies are intended to get people out of their cars by promoting smart growth principles such as: development near public transit; projects that include a mix of residential and commercial use; and projects that include affordable housing to help reduce new housing developments in outlying areas with cheaper land. The bill also creates incentives for implementing the sustainable community strategies by allocating federal transportation funds only to projects that are consistent with the emissions reductions. Using a few low or zero emissions transit vehicles to efficiently move people instead of a large number of autos is a critical element of the region's sustainable strategies. AMBAG will be updating the Metropolitan Transportation Plan, the federally-mandated long-range transportation plan for the Monterey Bay Area, in 2012. The updated Plan will include the region's first Sustainable Communities Strategy in compliance with SB375. Improved transit service, integrated with the forecast development pattern for the region, will be a key component of the Sustainable Communities Strategy.

**3.1.1 Traffic Congestion Relief Need**

From a traffic operations standpoint, congestion at unacceptable levels is currently experienced in multiple locations, and the situation is projected to worsen without effective transportation investment. Existing level of service on roadways within urbanized Monterey County is depicted in **Figure 3-1**.

Congestion is anticipated to grow as both intra-county and inter-county trip demand is increased by further development within both Monterey County and the region. The Regional Transportation Plan indicates that the number of daily vehicle hours of delay will more than triple between 2005 and 2035, even with implementation of the infrastructure improvements identified by the Plan. This increase in delay is anticipated to occur on all types of roadways, from freeways to two-lane roads. Year 2030 level of service, including planned highway improvement projects is depicted in **Figure 3-2**. Roadway capacity is forecast to be exceeded in many instances.

As indicated back on **Figure 3-1**, portions of SR-1 along the project corridor currently operate at level of service (LOS) F within the study area, indicating that traffic demand exceeds the roadway’s theoretical capacity, leading to poor roadway operation. LOS F conditions are generally associated with extensive weekday periods of very heavy congestion. This congestion has been acknowledged in virtually all prior transportation planning documents addressing the area. Traffic operations are expected to further deteriorate when projected traffic volumes associated with approved or planned but not yet constructed development projects in the vicinity are added to existing traffic volumes. **Table 3-1** illustrates existing and future traffic conditions in average annual daily traffic volumes and the corresponding levels of service on SR-1 within the project area.

**Table 3-1**  
**Highway 1 Traffic Volumes and Level of Service\***

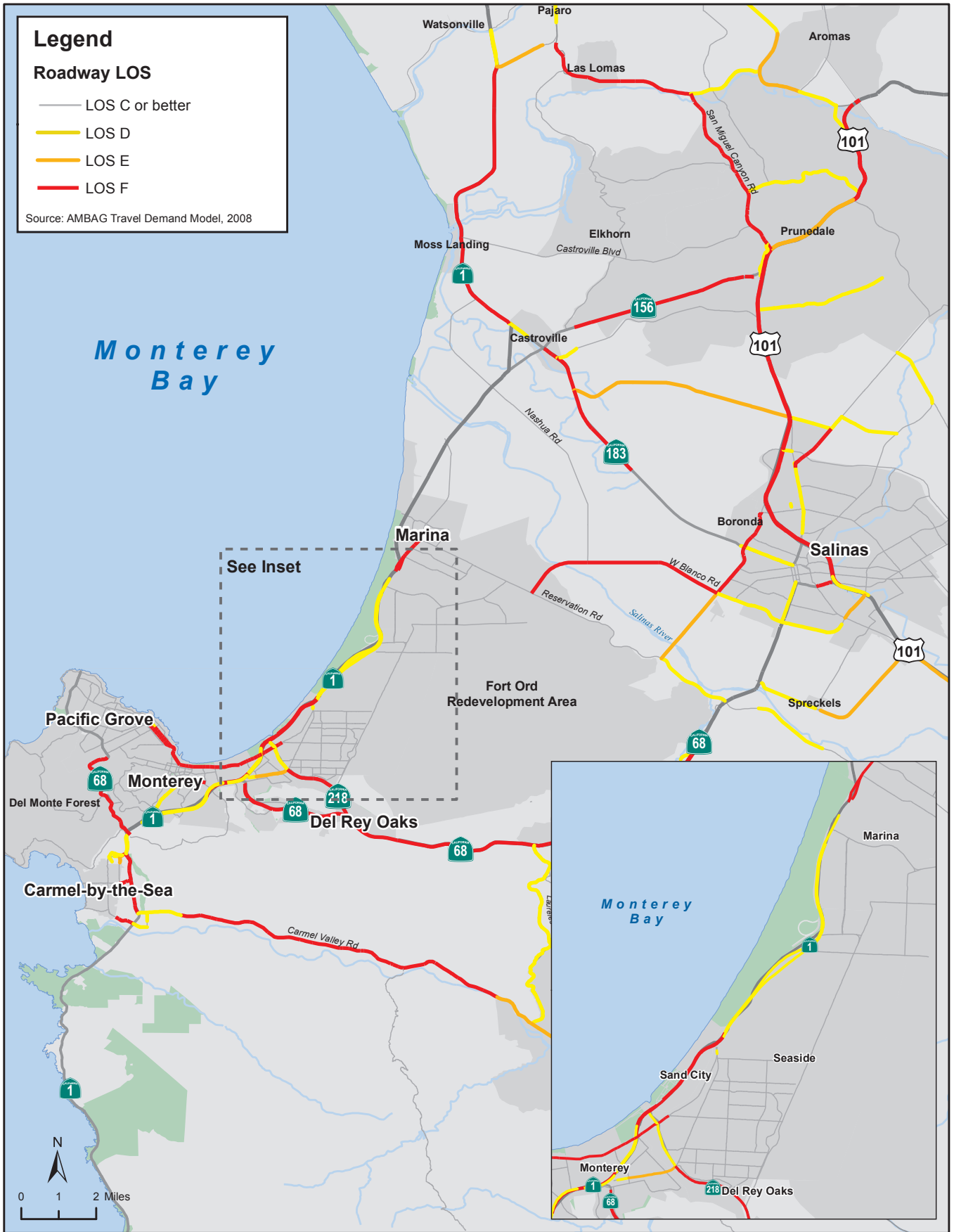
SEGMENT	2008 AADT	2030 AADT
Fremont Blvd. to Canyon Del Rey Blvd.	69,500 (F)	79,200 (C) <sup>1</sup>
Canyon del Rey Blvd. to Del Monte Ave.	74,000 (F)	79,800 (F)
Del Monte Avenue to N. Fremont St.	60,500 (D)	61,800 (D)
N. Fremont St. to Aguajito Rd.	97,500 (F)	99,700 (F)

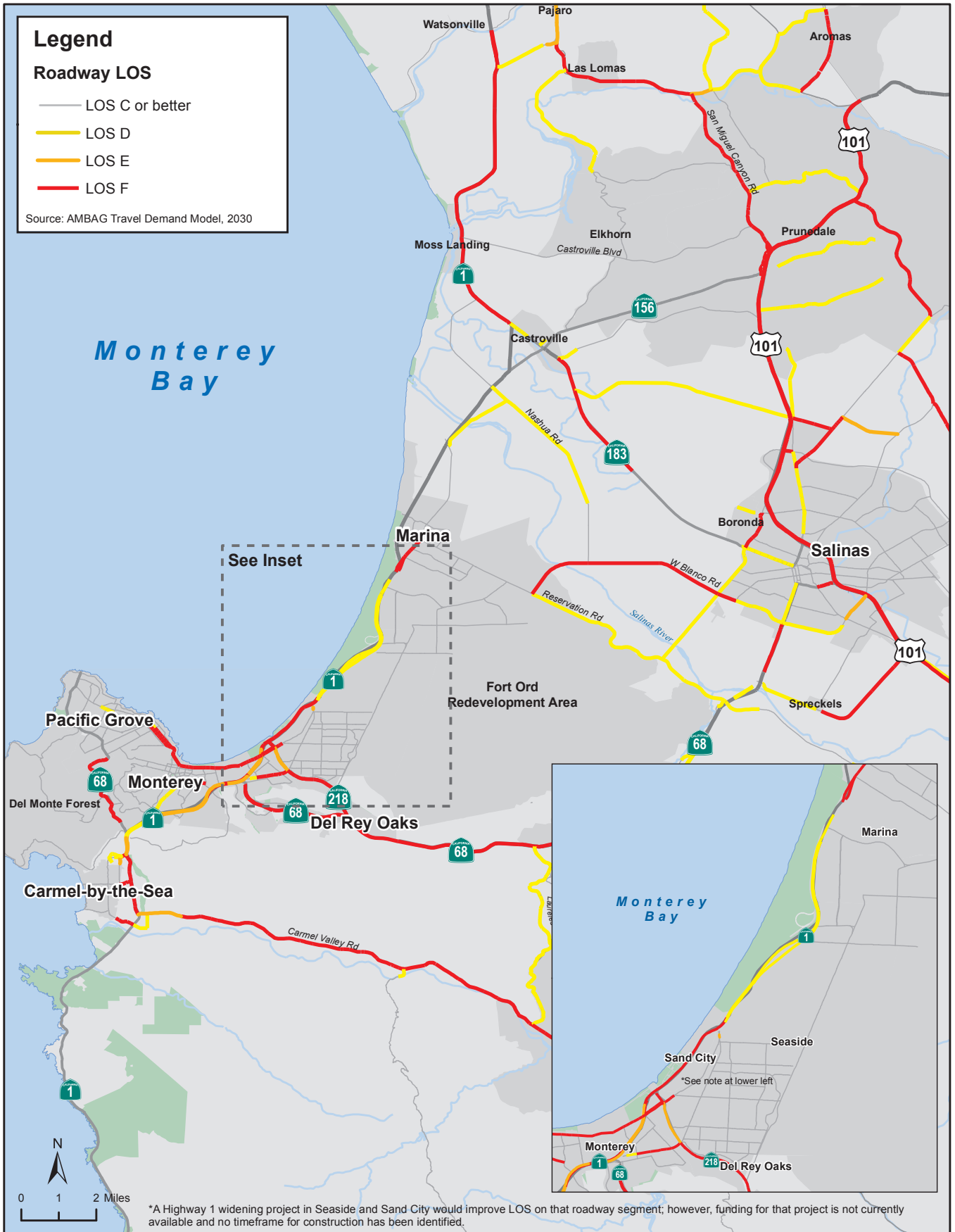
\*Florida Department of Transportation 2009 *Quality/Level of Service Handbook*, Table 1

<sup>1</sup> This segment of SR-1 is planned in the long-term to be widened from 4 to 6 lanes, although funding is currently not available.

It should be stressed that although a number of mitigation measures have been proposed, including SR-1 widening projects between Canyon del Rey and Fremont Boulevard and interchange improvement proposals, sufficient funding does not currently exist to pay for these projects. The long-proposed SR-1 widening projects may never gain approval because of the associated environmental impact, regardless of funding.

Heavy congestion is additionally experienced on surface streets running parallel to SR-1. Del Monte Boulevard, which parallels SR-1 in Marina, is currently operating at LOS F, and congestion is anticipated







to continue to grow as development projects are constructed. Additionally, portions of Del Monte Boulevard and Fremont Boulevard, which parallel SR-1 in Sand City and Seaside, are also currently operating at LOS E or F, and are forecast to become more congested in the future.

The number of trips between North Monterey County, the Monterey Peninsula and Greater Salinas on SR-1 is anticipated to grow by over 21 percent between 2000 and 2030. This growth is almost entirely driven by local trips originating on the Monterey Peninsula and in Salinas and destined for employment centers in Monterey. These trips currently have limited mode and route alternatives besides SR-1 and parallel surface streets. The growth in local traffic will further strain the highway network, much of which is already at capacity. The improvement of transit by the proposed project in the corridors connecting these three local areas provides an alternative transportation mode, potentially significantly reducing the growth in traffic and congestion growth on the highway network.

### ***3.1.2 Transit Service Enhancement Need***

MST Line 20 covers 19.3 miles as it travels between Salinas and Marina, along the Peninsula to Downtown Monterey. In that distance, there are 43 bus stops, or less than one-half mile between stops, and the round trip running time is currently about 105 minutes, yielding an average speed of 22 mph. This speed is relatively high due to a lack of stops in the rural area between Salinas and Marina, and Marina and Seaside. However, much of this rural area is planned for development, which will result in longer trip times and slower speeds. Already, in the more urban areas along the route, travel speed is slow and unpredictable because transit vehicles do not have a separate corridor, resulting in challenges for transit to remain competitive with auto travel. MST Route 20 has had problems with on-time performance, particularly for eastbound trips during the PM peak travel time, where late bus arrivals frequently result in missed transfers. Line 20 currently serves more than 2,070 riders on an average weekday.

***Home and Work Trips.*** MST on-board surveys indicate that over 50 percent of all riders begin their transit trip from home (with 28 percent traveling to work). Approximately 78 percent of riders indicate that they walk to access the bus and of these, 63 percent walk less than five minutes to access the bus and 67 percent walk less than five minutes after they got off the bus. This data indicate that a large number of existing riders live and/or work near existing transit service lines. It is expected that the proposed project's service improvements will result in increased transit usage by residents, especially those living and working in the transportation study corridor. Moreover, the significant amount of entitled residential, commercial, and educational facilities that are planned to be constructed in close proximity to the corridor present a yet to be captured transit market.

***College and School Riders.*** The percentage of riders who listed school or college as a destination (8 percent) is low given commonly achieved high transit utilization by students in comparable areas, and the large number of schools in the transportation corridor, including the Naval Postgraduate School, Monterey Peninsula College, the Monterey Presidio, California State University Monterey Bay (CSUMB), and various local high schools. By directly serving these institutions and providing a more frequent and more attractive travel alternative, it is expected that a significant number of students could be attracted to the transit market by the proposed project.

***Frequency and Connectivity of Service.*** MST Line 20 operates at 30 minute headways during peak travel periods with an occasional “tripper” added to produce 15 minute service. Trips between Monterey and Salinas on other lines often require a transfer somewhere along the route. It is expected that the proposed transit service will operate on 10 to 15 minute peak headways and the schedule adherence will improve with the provision of new transit infrastructure. In addition, a one seat ride (no transfers) could be provided in the case of the BRT alternatives for Salinas to Monterey Peninsula origin-destination pairs.

***Transit Dependent Riders.*** Approximately 68 percent of all MST riders pay cash fares (not monthly passes). In addition, 64 percent of riders report that they were from one-vehicle households, 49 percent lived alone, and 68 percent had annual incomes of \$30,000, or less. All of these factors are indicators of transit dependence. Improved transit alternatives are needed to better serve those currently dependent on transit. Further, since existing MST ridership is composed largely of the transit dependent, an untapped market exists with respect to choice riders who do not currently use transit but will have the opportunity if living or working near the proposed fixed-guideway alignment.

***Requested Line 20 Service Improvements.*** As part of the on-board bus rider survey taken in early 2006, four potential service improvements, from a list of nine, were given top (1 to 3) priority ratings by at least half of the MST Line 20 riders who completed a questionnaire:

- More frequent service (70 percent)
- Later evening service (70 percent)
- More lines (64 percent)
- Reduced travel times (51 percent).

Transit improvements would allow the provision of more frequent service during peak periods (10 to 15 minute peak headways) and service into the evening as demand warrants. More frequent service (shorter headways) will also improve transfer connections, increasing the effectiveness of the greater MST network. A service with more direct and efficient connections, less stops, and is not impacted by roadway congestion will provide reduced overall travel times (for transit users and roadway users) and greater convenience.

### ***3.1.3 Environmental Protection Need***

A deep concern and respect for coastal and inland environmental issues and environmental protection are part of the local fabric and are mandated by federal, state, county, and Monterey Peninsula city agencies. Monterey County and the Monterey Peninsula cities, in particular, have long deemed that development proposals will not be approved without the inclusion of effective and enforceable environmental controls

Agriculture and tourism are the two largest generators of jobs and, together, contribute a significant proportion of total economic development in Monterey County. Both of these land uses are highly dependent on maintaining a sound, attractive environment. The area is everything from a world-recognized produce market, whose vegetable farms feed a large part of the country, to a fragile Monterey Bay aquatic sanctuary.

In addition to local preferences and demands, a number of agency mandates require that environmental issues be thoroughly studied and problems documented well in advance of approving any transportation

project or other development. These agencies include the Environmental Protection Agency (EPA) at the federal level, California Environmental Quality Act (CEQA) at the state level, Coastal Commission at the regional level, Association of Monterey Bay Area Governments and Monterey County at the county level, and every planning agency at the local level. Two agency mandates are especially relevant to the proposed project and are discussed below.

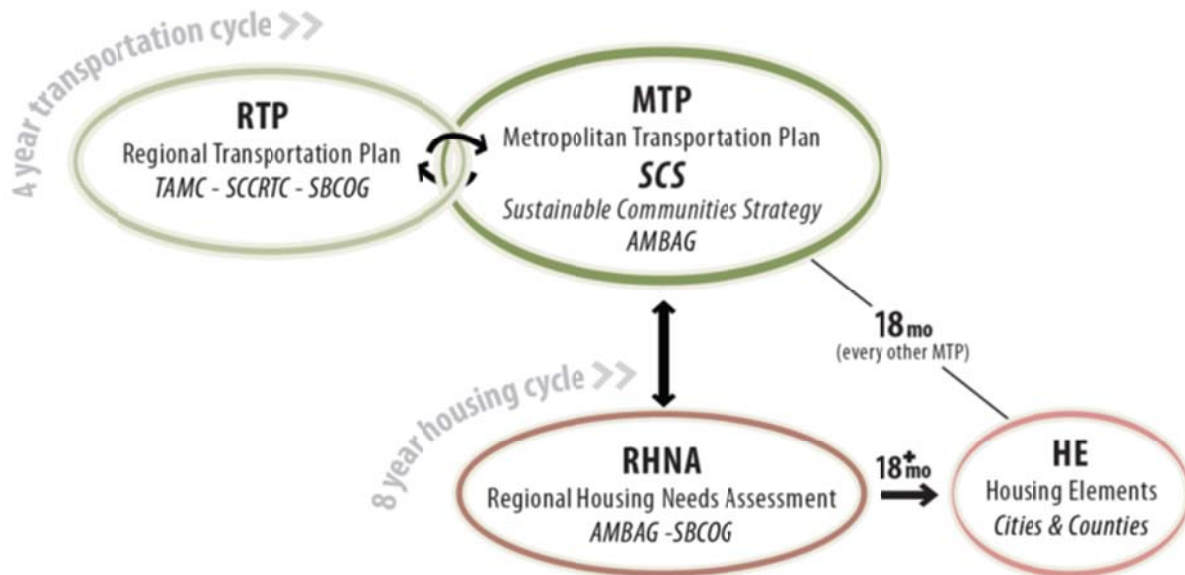
### ***3.1.4 Sustainable Community Need***

A recent trend is for transportation project funding applications to be considered on a priority basis, depending on how they measure up to local-regional growth and development mandates. Projects which promote more efficient, effective, and environmentally safe solutions are moved to the front of the list, while other projects receive a lower priority. This is a very important consideration in terms of the proposed transportation investment. By virtue of embracing the managed growth and environmental protection elements required by recent state legislation, the proposed Monterey Peninsula Fixed-Guideway project will potentially be viewed as a higher priority investment. A number of planned land development projects result in traffic impacts that cannot be fully mitigated based on proposed transportation facilities improvements and current funding prospects. Therefore, this project may be critical to the continued growth of the urban portion of the county.

The relationship between development projects, environmental requirements and the availability of federal funding to support these projects changed considerably in light of SB 375. As stated previously, the bill requires regional governing bodies in each of the state's major metropolitan areas to adopt a "sustainable community strategy." The bill is intended to reduce greenhouse gases through more efficient municipal services and transportation infrastructure. It has recently been seen as a catalyst to streamlining infill and transit-oriented development, allowing developers to more quickly meet growing real estate market demands. Agencies are also legislatively mandated to meet the region's target for reducing GHG emissions as part of the regional transportation plan. Specific strategies focus on reducing single-occupant vehicles by promoting smart growth principles such as concentrating development near public transit, encouraging projects that include a mix of residential and commercial uses, and including affordable housing within infill development to help reduce demand for new housing developments in outlying areas. The bill also creates incentives for implementing these sustainable community strategies by allocating federal transportation funds only to projects that are effective in their approach to emissions reduction.

AMBAG, in its role as the Metropolitan Transportation Organization, is responsible for developing the sustainable community strategy and identifying the steps needed to meet regional greenhouse gas targets. The sustainable community strategy will identify the areas within the region sufficient to house all the population of the region, a transportation network to service the population, and a development pattern that will, when taken in conjunction with the transportation network, achieve the specified greenhouse gas targets. AMBAG will incorporate the sustainable community strategy into the Metropolitan Transportation Plan, scheduled for adoption in 2013/2014. However, it is up to the individual cities and counties to implement the land use elements of the sustainable community strategy, through individual housing elements and zoning ordinances. This arrangement is illustrated in **Figure 3-3**, prepared by AMBAG to document the sustainable community strategy planning processes.

**Figure 3-3: Sustainable Community Strategy Coordinated Planning Processes**



Source: AMBAG

The project will both function as a critical element of the sustainable communities strategy by improving the sustainability of the transportation network, and will benefit from the local land use policy framework required to implement the sustainable community strategy. Much of that sustainable land use policy framework has already been adopted by the Monterey Peninsula jurisdictions through zoning and planning policies and requirements that support transit-oriented land use and transit service. The project will be supported by those transit-friendly policies adopted by local governments, as well as serve as a catalyst for implementing the locally-developed sustainable community vision. The following existing, local planning, policy and ordinance documents contain transit-supportive land use provisions and guidelines:

- City of Marina Zoning Ordinance;
- City of Marina General Plan;
- City of Marina Downtown Marina Design Guidelines;
- City of Seaside Municipal Code;
- City of Seaside General Plan;
- Sand City Municipal Code;
- The City of Monterey City Code; and
- City of Monterey General Plan.

For a description of those specific policies and planned developments in each of the cities, refer to Alternatives Analysis Volume 1, Chapter 3.

All proposed elements of the Monterey Peninsula Fixed-Guideway Corridor project will be consistent with SB 375. The project will provide a tool allowing TAMC, MST, and other local agencies to meet the mandates as set forth in the bill. The project offers a transportation solution that facilitates orderly development and environmentally-secure conditions for residents and visitors alike.

### **3.2 Project Goals**

The purpose of this project is to improve the balance of transportation facilities and services in the Monterey Peninsula and accommodate intra-county travel for residents of Monterey County; and secondarily, for visitors to Monterey County. These transportation facilities and service must be provided in a cost efficient manner so that limited financial resources can be utilized to their greatest potential.

This project will need not only to remove auto trips from the heavily congested SR-1 but also to enhance mobility opportunities for the diverse local population to jobs, health services and entertainment.

The following is a list of ways the project, can address the transportation problems in the study corridor:

- Limit existing and future traffic congestion on regional, arterial, and local roadways;
- Implement environmentally responsible “green” transportation programs which address local area demands and satisfy federal, state, and regional agency mandates;
- Adhere to State of California mandates requiring the accommodation of future population and development growth through the implementation of “cleaner” transportation facilities which encourage transit-oriented planning and development;
- Provide ability to expand transit services with projected growth and maintain the opportunity for possible future intercity rail to the City of Monterey;
- Provide congestion alleviation and reduced trip time at a financial and environmental cost that is less expensive than widening SR-1;
- Develop a transit system that drives economic growth around stations, consistent with adopted land use policies;
- Enhance transit services through improvement in the following areas:
  - ♦ Travel time performance
  - ♦ Accessibility and travel time for transit dependent riders
  - ♦ Access to underserved and potential future transit markets
  - ♦ On-time performance and frequency of service.

### **3.3 Evaluation Criteria**

In order to identify a locally-preferred alternative that meets the project’s stated purpose and need, an evaluation methodology was developed to assess and compare each of the alternatives. The evaluation methodology is designed to ensure that both local priorities and FTA criteria are met.

The project purpose and need, and goals identified above, directly led to the identification of project objectives, against which the qualifications of each alternative could be measured.

- In order to relieve existing and forecast traffic congestion and address existing transit deficiencies, the project should attract and efficiently move transit riders. This result is best achieved with service that reaches a large number of residents and employees, particularly in areas populated with low-income households. The project’s ability to improve mobility of Monterey Peninsula residents and employees can be directly measured through ridership forecasts, trip travel time and the resulting estimated effect on auto trips.



- In order to improve the local environment and meet sustainability goals, the project should be environmentally-sensitive and minimize disruption to the natural and social landscape. The project should also promote smart growth policies by encouraging transit-oriented development.
- And finally, to meet the goal of efficiently using scarce financial resources, the project must be cost-effective, both in its capital and operating budgets.

In addition to these general evaluation criteria, local stakeholders identified a few specific areas of interest to assist in the selection of the locally-preferred alternative. These areas of local interest include the following:

- Access to and from activity centers
- Service quality
- Safety
- Linkages to the entire county
- Future expandability of the system
- Community support
- Noise
- Costs
- Traffic impacts

**Table 3-2** presents evaluation criteria that address issues important to local residents, officials, and stakeholders, and the FTA.

**Table 3-2**  
**Alternative Analysis Evaluation Criteria and Measures**

EVALUATION CRITERIA	MEASURES
Demographic and Equity Issues	<ul style="list-style-type: none"> <li>• Existing and project population</li> <li>• Existing and project employment</li> <li>• Existing and projected housing</li> <li>• Existing and projected number of low-income households</li> </ul>
Transit-Oriented Land Use	<ul style="list-style-type: none"> <li>• Subjective rating based on: Existing and future land use, transit supportive corridor policies and supportive zoning</li> </ul>
Environmental Concerns	<ul style="list-style-type: none"> <li>• Assessment of potential health, biological, and cultural “fatal flaws” associated with each alternative</li> <li>• Potential noise, vibration, traffic safety, and visual impacts</li> </ul>
Capital and Operating Expense	<ul style="list-style-type: none"> <li>• Total operating and maintenance cost per rider</li> <li>• Net operating and maintenance cost per new rider</li> <li>• Annualized capital costs per rider</li> </ul>
Improved Mobility	<ul style="list-style-type: none"> <li>• Annual hours and dollar costs</li> <li>• Total forecasted ridership</li> <li>• Change in transit ridership</li> <li>• Reduction in auto trips using congested roadways</li> </ul>
Cost-Effectiveness	<ul style="list-style-type: none"> <li>• Transit user system benefit</li> <li>• Travel time savings</li> <li>• Cost savings</li> <li>• Safety benefits</li> </ul>

## 4.0 Alternatives Development

### 4.1 Initial List of Conceptual Alternatives

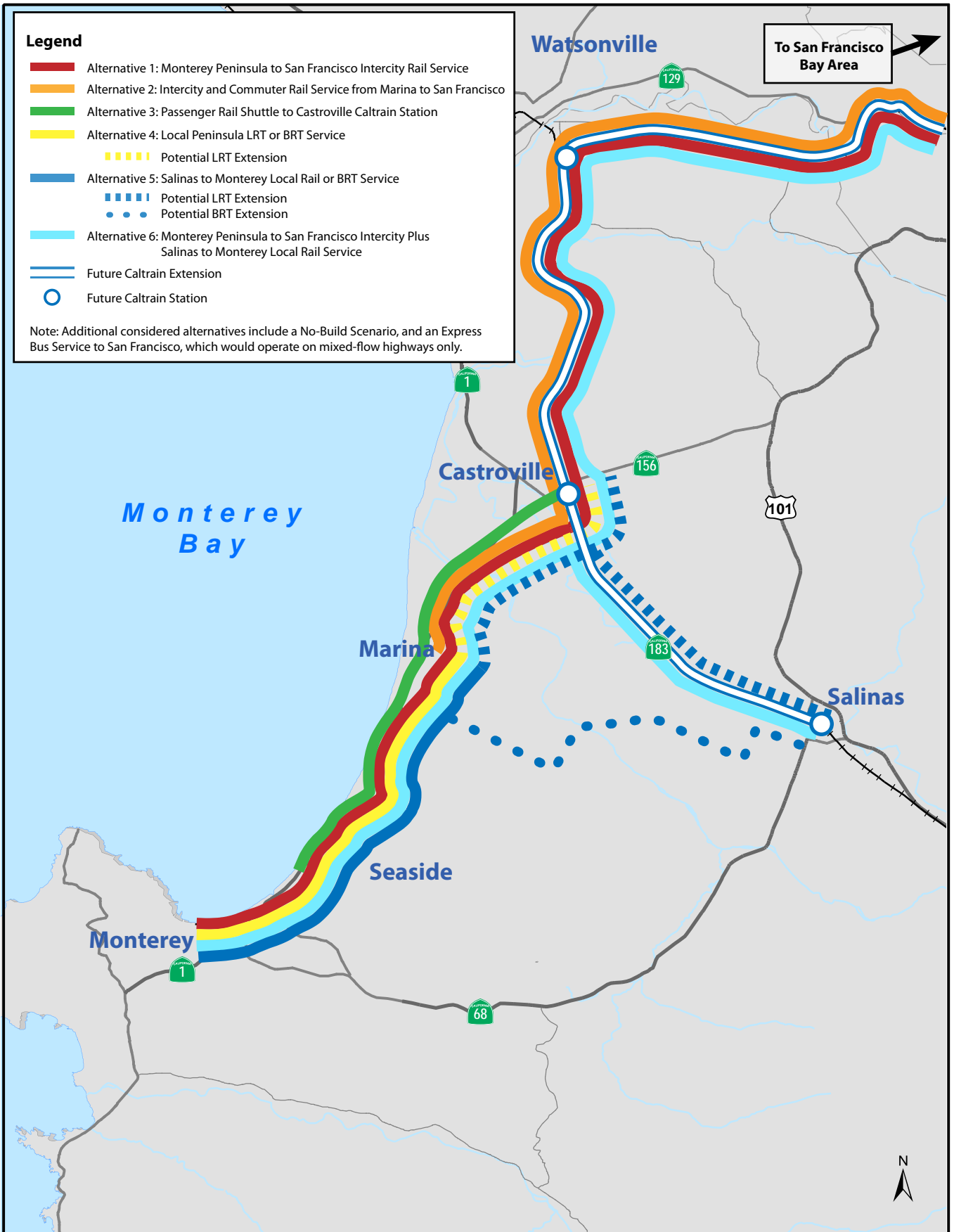
As noted in Chapter 1, systems planning studies identified the Monterey Peninsula corridor as one of two primary transportation corridors in Monterey County for future transit improvements. A number of alternatives for providing a range of multi-modal transportation infrastructure and service improvements in the corridor were proposed for further study. The transportation alternatives emphasized a range of levels of investment.

The Monterey Peninsula Fixed-Guideway Alternatives Analysis was initiated to provide further definition to these alternatives and assess their performance in meeting the purpose and need for transit improvements in the corridor. Consistent with the objective of starting with a long list of alternatives—so as not to prematurely preclude potentially viable transit solutions—the alternatives analysis subjected the seven systems planning alternatives proposing improvements in the Monterey Peninsula corridor to public comment and technical evaluation, including environmental screening.

The initial set of conceptual alternatives included a baseline alternative, which assumed there was no new major transit capital investment, and various build alternatives, some of which include major investments in bus and/or rail transit technologies, as follows:

- No-Build Rail Service
- Intercity Rail Service
- Intercity and Commuter Rail Service
- Passenger Rail Shuttle to Castroville Commuter Rail Service
- Local Monterey Peninsula LRT or BRT Service
- Salinas to Monterey Local Rail or BRT Service
- Intercity Rail Service plus Salinas to Monterey Local Rail Service
- Enhanced Local Bus plus Monterey County to San Francisco Peninsula Express Bus Service (transportation system management alternative)

These alternatives are depicted on **Figure 4-1**.



#### ***4.1.1 Screening of Conceptual Alternatives***

Design concepts for the seven build alternatives were regularly presented to policy boards, advisory committees and to interested parties within the community. Public outreach to obtain feedback on the benefits and drawbacks of each of the alternatives, and any potential variations they might include, was critical to the evaluation process. This public outreach process began in 2004 and continued through the refinement of alternatives for analysis. Meetings were held throughout the corridor to present the alternatives and obtain public feedback. For the complete list of public outreach meetings and events, please see Alternatives Analysis Volume 1, Chapter 7.

During this period, capital and operating cost information, together with mode technology information, right-of-way utilization and renderings of potential station designs, were prepared and presented to the Rail Policy Committee, the designated alternatives analysis study advisory committee, as well as at the public workshops. Public involvement findings and a qualitative evaluation of alternative performance were also shared with the committee.

Results of the evaluation process were documented and used to compare how well alternatives addressed the project purpose and need. **Table 4-1** on the following page details each of the conceptual alternatives, including performance relative to project goals and acceptance by the community.

#### ***4.1.2 Identification of Select Alternatives for Further Analysis***

Based on the comparison of alternatives, in 2005, the Rail Policy Committee proposed that one of the alternatives, Local Peninsula Rail or BRT Service, continue through the next phase of project evaluation. The reasons for selecting this alternative (No. 4 in **Table 4-1**) included the benefits for mobility and the potential to mitigate growing congestion for intra-county travel along the SR-1 corridor; transit ridership benefits relative to costs; potential to phase the infrastructure investment; and strong public support for a transit investment that would provide local service to area residents.

To facilitate further evaluation of the alternative, which at the concept level offered either BRT or LRT service with two possible northern termini, it was separated into eight distinct alternatives:

- Three alternatives involved fixed-guideway BRT service. One provided this service between Monterey and Marina, one between Monterey and Castroville, and one between Monterey and Castroville, as well as between Marina and Salinas. The Marina to Salinas leg only included approximately half of its alignment on a dedicated fixed-guideway.
- Three alternatives involved LRT service. Similar to the BRT alternatives, two of the alternatives provided service between Monterey and Marina, and between Monterey and Castroville. An additional alternative provided service both from Monterey to Castroville and from Castroville to Salinas, the latter via the SR-183 corridor.
- One alternative was essentially a hybrid of the above BRT and LRT systems. It included providing inter-city rail between Monterey and the San Francisco Bay Area via the Monterey Branch Line corridor, LRT between Monterey and Marina via the Monterey Branch Line corridor, and BRT between Marina and Salinas, approximately half of which would be on a dedicated fixed-guideway.

**Table 4-1**  
**Qualitative Evaluation of Conceptual Alternatives**

	ALTERNATIVE <sup>1</sup>	ADDRESSES PURPOSE AND NEED	COMMUNITY ACCEPTANCE	FUNDABLE CAPITAL AND OPERATING COSTS	POTENTIAL FOR PHASED IMPLEMENTATION
<b>0</b>	<b>No-Build Rail Service</b> Existing transit services and limited road improvements.	<ul style="list-style-type: none"> <li>Congested corridors remain so</li> <li>Continuation of status quo</li> <li>Residential growth compounds problems</li> </ul>	<ul style="list-style-type: none"> <li>Residents desire traffic relief</li> <li>Visitor and agricultural businesses desire traffic relief</li> <li>Noise, air pollution, traffic reduce neighborhood cohesion/quality of life</li> </ul>	<ul style="list-style-type: none"> <li>Monterey Branch Line ROW purchased for \$9.3 million</li> <li>Local/state funding inadequate for county and interregional highway projects</li> <li>Limited public financial support for transportation</li> </ul>	<ul style="list-style-type: none"> <li>Basic bus service expanded as funding permits</li> <li>Limited roadway construction as funding permits</li> <li>Local initiative sales tax for transportation pending local and state economic recovery</li> </ul>
<b>1</b>	<b>Intercity Rail Service</b> Operate intercity train service between the Monterey Peninsula and San Francisco 2 or 3 roundtrips per day.	<ul style="list-style-type: none"> <li>Trains operated during off-peak commute hours</li> <li>Limited ridership forecast by earlier studies</li> <li>One station proposed at former Fort Ord</li> </ul>	<ul style="list-style-type: none"> <li>Community opposed to large train equipment (conventional locomotive hauled passenger coaches)</li> <li>Small diesel multiple unit trains proposed to address noise and vibration concerns</li> </ul>	<ul style="list-style-type: none"> <li>\$44 million order of magnitude capital cost, excluding equipment</li> <li>\$5 million net annual operating cost</li> </ul>	<ul style="list-style-type: none"> <li>Low potential for phasing</li> <li>Requires restoration of branch line track and bridges between Castroville and Monterey Bay station</li> </ul>
<b>2</b>	<b>Intercity and Commuter Rail Service</b> Operate intercity train service between the Monterey Peninsula and San Francisco plus two commuter rail roundtrips from Santa Clara County to the north side of Marina.	<ul style="list-style-type: none"> <li>Provides capacity/reduces traffic in the U.S. 101 corridor between Prunedale and Santa Clara/San Mateo counties</li> <li>Monterey Peninsula station would be inconveniently located, north of Marina near SR 1 and Del Monte Avenue</li> </ul>	<ul style="list-style-type: none"> <li>Community opposition to large train equipment (conventional commuter rail locomotive and passenger coaches) would reposition Monterey Bay station</li> <li>Out of sight station and service</li> </ul>	<ul style="list-style-type: none"> <li>Requires \$22 million for 5 miles of Monterey branch line track and bridge restoration</li> <li>Commuter rail service split between Salinas and Monterey Peninsula could reduce ridership yielding higher net public costs. \$7 million annually for combined services</li> </ul>	<ul style="list-style-type: none"> <li>Commuter rail service could be phased to service either Salinas or Monterey Peninsula</li> <li>Stations can be constructed as funding permits</li> <li>Requires restoration of branch line track and bridges between Castroville and Monterey Bay station</li> </ul>
<b>3</b>	<b>Passenger Rail Shuttle to Castroville Commuter Rail Service</b> Operate connecting shuttle service between Seaside and Castroville to meet commuter rail service extension.	<ul style="list-style-type: none"> <li>Provides capacity/reduces traffic in U.S. 101, SR 1, and SR 156 corridors</li> <li>Shuttle Stations centrally located in Seaside and Marina to connect to Castroville</li> </ul>	<ul style="list-style-type: none"> <li>Rail shuttle would extend “reach” of commuter rail service, with smaller vehicles</li> <li>Reduces long distance vehicle trips, thereby improving air quality</li> </ul>	<ul style="list-style-type: none"> <li>\$82 million capital cost for Monterey Branch Line shuttle</li> <li>Low net annual operating cost, \$2–3 million/year for combined service</li> </ul>	<ul style="list-style-type: none"> <li>Passenger rail shuttle requires construction and operation of commuter rail extension to Salinas</li> <li>Passenger rail shuttle could be added later</li> <li>Shuttle service could be extended to Monterey station(s)</li> </ul>
<b>4</b>	<b>Local Peninsula Rail or BRT Service</b> Construct LRT or BRT Guideway between Monterey and Marina, or extend LRT to Castroville.	<ul style="list-style-type: none"> <li>Provides capacity/reduces traffic in U.S. 101, SR 1, and SR 156 corridors</li> <li>Stations located throughout Monterey, Seaside/Sand City and Marina</li> </ul>	<ul style="list-style-type: none"> <li>Provides local peninsula service, voiced in numerous public meetings</li> <li>Provides local stations, serving local residents</li> </ul>	<ul style="list-style-type: none"> <li>\$75 to 125 million capital cost for Monterey Branch Line local service, depending on length of service</li> <li>Relatively low net annual operating cost. Local LRT/BRT replaces existing bus route</li> </ul>	<ul style="list-style-type: none"> <li>Local service extended in stages</li> <li>Marina to Castroville local service requires replacement of Salinas River bridge</li> </ul>
<b>5</b>	<b>Salinas to Monterey Local Rail or BRT Service</b> Construct LRT or BRT guideway between Monterey and Marina. Extend LRT guideway to Castroville via Monterey Branch Line and Salinas along Coast Mainline. Alternately, extend BRT guideway to Salinas via Blanco or Davis roads.	<ul style="list-style-type: none"> <li>Provides capacity/reduces traffic in U.S. 101, SR 1, and SR 68, SR 156, Blanco/Davis Road corridors</li> <li>Stations located throughout Monterey, Seaside, Sand City, Marina, Castroville and Salinas</li> </ul>	<ul style="list-style-type: none"> <li>Provides local Peninsula and Salinas to Peninsula service, voiced in numerous public meetings</li> <li>Provides local stations, serving local residents</li> <li>Environmental constraints may limit options for BRT guideway construction between Marina and Salinas</li> </ul>	<ul style="list-style-type: none"> <li>\$155 million capital cost for Monterey Branch Line local and intra-county service, depending on mode of service</li> <li>Relatively low net annual operating cost. Local LRT/BRT replaces existing bus route</li> </ul>	<ul style="list-style-type: none"> <li>Commuter rail extension or Peninsula local and intra-county service constructed independent from one another</li> <li>Local and intra-county service extended in stages</li> <li>Marina to Castroville service requires replacement of Salinas River bridge</li> </ul>
<b>6</b>	<b>Intercity Rail Service Plus Salinas to Monterey Local Rail Service</b> Construct LRT between Monterey, Castroville and Salinas. Operate intercity rail service from Monterey to San Francisco. Use FRA-compliant diesel multiple rail equipment for both services.	<ul style="list-style-type: none"> <li>Provides capacity/reduces traffic in U.S. 101, SR 1, and SR 68, SR 156, Blanco/Davis Road corridors</li> <li>Stations located throughout Monterey, Seaside, Sand City, Marina, Castroville and Salinas</li> </ul>	<ul style="list-style-type: none"> <li>Provides local Peninsula and Salinas to Peninsula, and intercity service to San Francisco service, voiced in numerous public meetings</li> <li>Provides local stations, serving local residents and visitors</li> <li>Diesel multiple unit (DMU) equipment requires taller (higher) station platforms</li> </ul>	<ul style="list-style-type: none"> <li>\$155 million capital cost for Monterey Branch Line local and intra-county service</li> <li>Relatively low net annual operating cost for local intra-county and commuter rail extension services</li> <li>\$5 million annual net public cost for intercity service to San Francisco</li> </ul>	<ul style="list-style-type: none"> <li>Commuter rail extension or Peninsula local and intra-county service constructed independent from one another</li> <li>Intercity service can be added when funding permits</li> <li>Local and intra-county service extended in stages</li> <li>Marina to Castroville service requires replacement of Salinas River bridge</li> </ul>
<b>7</b>	<b>Express Bus Service to San Francisco Peninsula</b> Low cost transit investments to match locally preferred build alternative. Includes major roadway construction to provide capacity/reduce congestion.	<ul style="list-style-type: none"> <li>Express bus is not enough</li> <li>Widening U.S. 101, SR 1, SR 68, SR 183 or SR 156, and Blanco/Davis Roads will address transportation needs</li> </ul>	<ul style="list-style-type: none"> <li>Roadway improvement needs are well recognized</li> <li>Environmental and funding constraints limit transportation solutions</li> </ul>	<ul style="list-style-type: none"> <li>\$1,234 million of roadway projects identified by RTP to address specific purpose and need of transit investment</li> </ul>	<ul style="list-style-type: none"> <li>Requires a number of unfunded or long-term highway infrastructure projects</li> </ul>

<sup>1</sup> All alternatives include commuter rail extension to Salinas, with stations in Pajaro and Castroville, as a base assumption. The commuter rail extension is currently under study as a separate project.



For a basis of comparison, a transportation system management modal option was posited, which included:

- Enhanced bus service between Monterey and Salinas, via Marina.

All eight of these more detailed build alternatives assumed there would be improved transit connection between the Monterey Peninsula corridor serviced and an intercity rail station in Salinas.

Public outreach was performed to obtain feedback and input on the effectiveness of the alternatives in meeting project goals. For the complete list of public outreach meetings and events, please see Alternatives Analysis Volume 1, Chapter 7.

Each of the alternatives was, as for the initial set of conceptual alternatives, evaluated for costs, feasibility of implementation, and funding, among other factors. Upon the completion of preliminary capital cost estimates for the four alternatives, it was determined that three of the alternatives were not feasible due to its high cost relative to funding. These alternatives were the “hybrid” option, which included inter-city rail, LRT and BRT, the LRT alternative that included service from Castroville to Salinas, and the BRT alternative that included BRT services to both Castroville and Salinas. The projected total cost for each of these alternatives was greater than the \$250 million threshold for FTA Small Starts projects, which TAMC and local officials were intending to qualify for, and thereby disqualified the hybrid/combo alternative from funding eligibility under that federal program.

Because of the difficulty in qualifying a local project for FTA New Starts funds (which are geared more towards large projects involving light or heavy rail in densely populated areas), the RPC and alternatives analysis study team decided that for any alternative to move forward, it must have a capital cost estimate below the \$250 million Small Starts threshold.

Therefore, based on costs and other factors, in late 2007 the RPC elected to proceed with the two remaining BRT build alternatives, the two remaining LRT build alternatives and the enhanced bus alternative.

Additionally, and common to all Build Alternatives, is the extension of commuter rail service to Monterey County. This commonality, as previously discussed, reflects a decision on the part of the Rail Policy Committee to exclude from further consideration *any* build alternative that did not include the extension of commuter rail service to Salinas.

## 4.2 Detailed Definition of Selected Alternatives

As discussed above, eight build alternatives were originally defined for capital cost estimating purposes and further qualitative analysis as part of the Monterey County Fixed-Guideway Study. Following this assessment, three alternatives were removed due to their high cost. The five remaining build alternatives, encompassing three distinct modes—LRT, BRT, and enhanced bus—were selected for further analysis. The final build alternatives selected for the detailed alternatives analysis are summarized below, and discussed in more detail throughout this section.

- **BRT-1:** Bus Rapid Transit (BRT) service would be operated along a fixed-guideway, mostly along the Monterey Branch Line, from downtown Monterey to northern Marina. BRT service

would also occur on surface roadways between Marina and intercity rail stations at Castroville and Salinas.

- **BRT-2:** Bus Rapid Transit (BRT) service would be extended on the Monterey Branch Line between Marina and the intercity station at Castroville. BRT service would also occur on surface roadways between Marina and the intercity rail station at Salinas.
- **LRT-1:** Light Rail Transit (LRT) service would be operated along a fixed-guideway, mostly along the Monterey Branch Line, from downtown Monterey to northern Marina. Standard bus service would connect with the LRT, and would run on surface roadways between Marina and the intercity rail stations at Castroville and Salinas.
- **LRT-2:** Light Rail Transit (LRT) service would be extended on the Monterey Branch Line between Marina and the intercity rail station at Castroville. Standard bus service would connect with the LRT, and would run on surface roadways between Marina and the intercity rail station at Salinas.
- **Enhanced Bus:** This alternative is defined to emulate the light rail transit, bus rapid transit, and the intercity rail service connections offered by the other alternatives, without the benefit of a fixed-guideway dedicated for transit use.

The benefits and ridership of each of these alternatives would be enhanced with implementation of the planned commuter rail extension project. However, the commuter rail extension project was neither included as a component of any of these alternatives, nor as a base assumption when evaluating the alternatives. All alternatives evaluation, including ridership projections, contained in the *Monterey Peninsula Fixed-Guideway Study Alternatives Analysis* do not assume completion of the commuter rail extension.

The following sections provide additional detail on each of the final alternatives included in the alternatives analysis project evaluation and screening process. To establish setting, a No-Build condition is described first, followed by a description of the transportation system management improvements proposed under the enhance bus alternative. Detailed descriptions of the BRT and LRT build alternatives follow.

#### **4.2.1 No-Build**

Some of the existing bus routes will be altered to provide a “background bus service” component for the no-build, enhanced bus (transportation management system), bus rapid transit, and light rail transit fixed-guideway alternatives. These modifications are driven by near-term development patterns, particularly in the Fort Ord Redevelopment Area (FORA), and by the planned commuter rail extension to Salinas. Three significant changes to the existing bus network are assumed for the “background bus network.”

**Line 20, Salinas–Monterey:** Relocate Monterey terminus to relocated Transit Plaza at Figueroa and Del Monte in downtown Monterey. Realign route through FORA to serve the Dunes on Monterey Bay, CSUMB, and the proposed Eighth Street/University Transit Center. Improve headways to 20 minutes over entire route from Salinas to Monterey.

**Line 27, Watsonville-Monterey:** End at Del Monte Boulevard and Reindollar Road in downtown Marina. Delete service south of Reindollar Road. Improve headways to 60 minutes, weekdays and Saturdays.

**Line 28, Watsonville–Salinas via Castroville:** In Castroville, serve the proposed commuter rail station via Salinas Street/Benson Road. In Pajaro, operate via “special service” alignment (Salinas Road, Main Street, 2<sup>nd</sup> Street) to/from Watsonville Transit Center.

A number of routes not listed above would be realigned to terminate at a proposed new transit center in Monterey at Del Monte Boulevard and Figueroa Street. For a complete list of changes, please refer to the Alternatives Analysis Volume 1, Chapter 5.

#### **4.2.2 Enhanced Bus Alternative**

This alternative is defined to best achieve the project goals and objectives without the benefit of a fixed-guideway or significant infrastructure improvements.

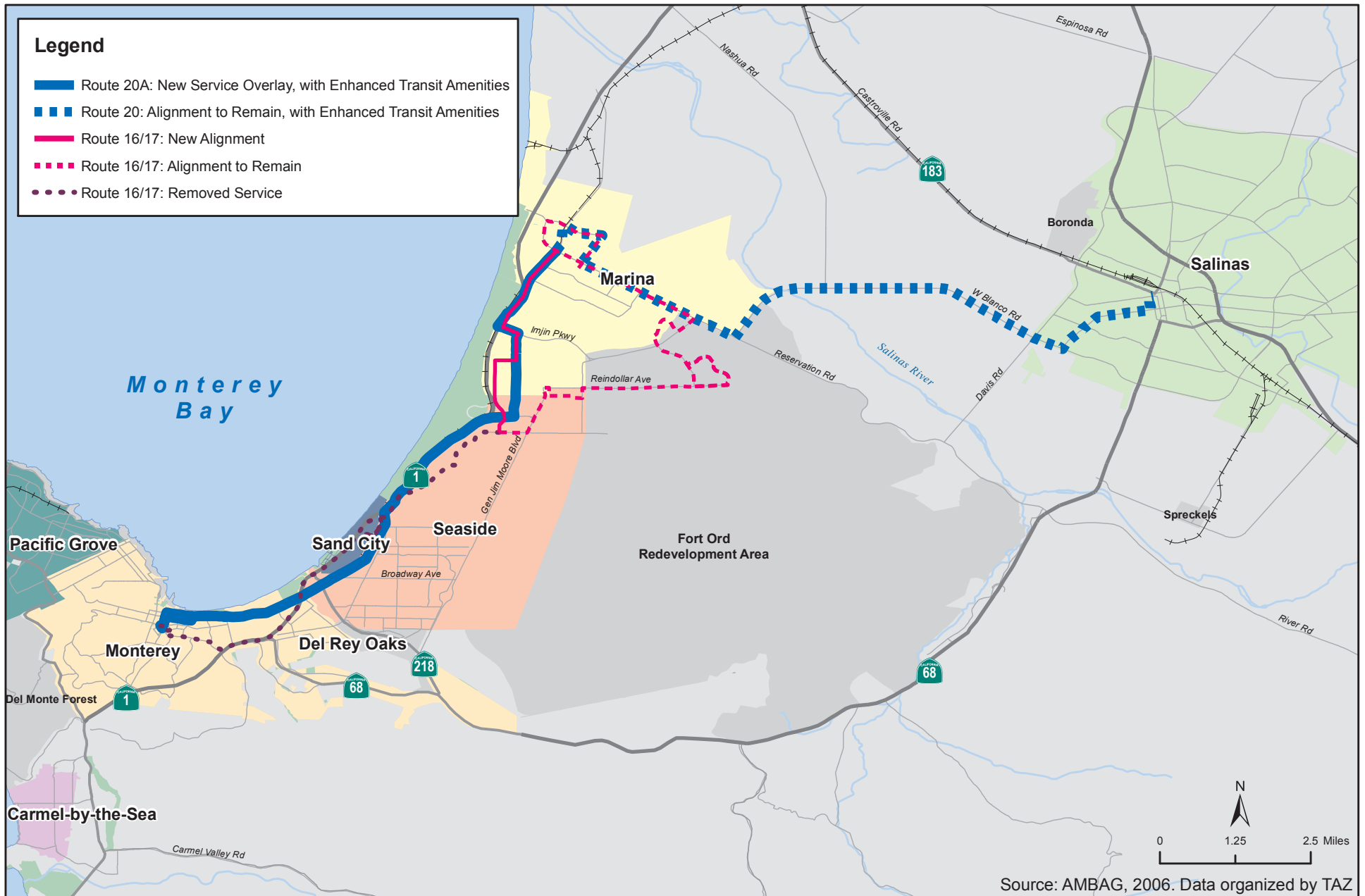
The enhanced bus alternative includes no-build bus operations and maintenance assumptions. It also includes further local bus service enhancements/modifications to Lines 16/17 and 20, both of which currently serve the transportation study corridor. The route modifications from the no-build alternative are described below and route alignments are depicted in **Figure 4-2**.

Route 16/17 would be restructured to primarily serve Marina and FORA. Service south of Gigling Road at General Jim Moore Boulevard would be eliminated. Operate as clockwise (Line 16) and counterclockwise (Line 17) loop route over remainder of alignment. Operate on 2<sup>nd</sup> Avenue, Eighth Street and Imjin Parkway to serve the proposed University Villages (Dunes on Monterey Bay) Transit Center. Operate seven days per week. Improve headways to 30 minutes.

Route 20 would be significantly enhanced from the no-build alternative to provide high-quality transit service with improved amenities and frequency. Headways would be improved to 20 minutes over entire route from Salinas to Monterey. Additionally operate a short line (Line 20A) from Marina Transit Station to downtown Monterey with 20-minute headways, yielding 10 minute frequency of service from Marina to Monterey.

Transit stop amenities along Line 20 would be improved. Where feasible, bus stop pullouts would be constructed, if not already provided. High quality bus shelters would be installed at all stops, replacing MST standard units where provided. Public telephones, passenger information displays, audio/dynamic video message boards, lighting, trash receptacles, and seating would be added as space permits. **Table 4-2** provides an inventory of capital improvements and bus stop locations along the Monterey Peninsula portions of the route.

Articulated, low-floor, advanced design buses would be acquired to operate this service. It is anticipated that the fare for the enhanced bus service would remain the same as for local bus service. Five parking lots, totaling 494 spaces, would be implemented along the enhanced route.



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FIGURE 4-2  
ENHANCED BUS ALTERNATIVE ALIGNMENT

**Table 4-2**  
**Enhanced Bus Alternative Capital Improvements**

STOP/LOCATION	TURNOUT		SHELTER PACKAGE		BICYCLE LOCKERS		PARKING SPACES	TRAFFIC SIGNAL PRIORITY	OTHER
	SB	NB	SB	NB	SB	NB			
DeForest Road and Beach Road	✓	✓	A	A	20	—	—	—	
Marina Green Drive	✓	✓	A	A	20	—	113	✓	—
Beach Road	✓	✓	A	A	20	—	—	✓	—
Reservation Road	Extend	✓	2 x A	2 x A	20	—	—	✓	Transit Exchange
Palm Avenue	Existing	✓	A	A	20	—	21	✓	—
Reindollar Avenue	—	—	—	—	—	—	—	✓	—
Imjin Parkway and Second Avenue	Existing*	Existing*	A	A	—	—	—	✓	—
Eighth Street and First Avenue	—	—	—	—	—	—	144	—	Transit Center
Second Avenue and First Street	Existing	Existing	A	A	—	—	—	—	—
Highway 1/Monterey Road	—	—	—	—	—	—	—	✓	—
Playa Avenue	—	—	—	—	—	—	—	✓	—
Tioga Avenue	—	—	—	2 x A	—	20	45	✓	Transit Exchange
Contra Costa or Broadway	✓	✓	A	A	—	—	—	✓	—
Canyon Del Ray Boulevard	Existing	✓	A	A	20	—	—	✓	—
English Avenue	Existing	Existing	A	A	—	—	—	✓	—
Casa Verde Way	Existing	Existing	A	A	20	—	171	✓	—
Naval Postgraduate School	✓	—	A	B	20	—	—	✓	—
Sloat Avenue	—	—	—	—	—	—	—	✓	—
La Playa Avenue/Camino Aguajito	Existing*	Existing*	A	A	—	—	—	✓	—
Camino El Estero	Existing*	Existing*	A	A	—	—	—	✓	—
Figueroa Street	—	—	—	—	—	—	—	✓	Transit Center
Washington Street	—	—	—	—	—	—	—	✓	—

\*Programmed by others

Source: Parsons



For preliminary cost estimating purposes, the reduction in stop frequency and the inclusion of traffic signal priority on Line 20 are assumed to offset reductions in speed associated with increased traffic congestion along the route. For the sake of simplicity, the number of vehicle miles and revenue hours, along with the peak period vehicle requirement is assumed to increase proportionally across the board during all time periods (weekdays, evenings, Saturdays and Sundays). The change in annual revenue vehicle hours and miles, based on FY 2006 no-build plus background bus data, are indicated in **Table 4-3** for Routes 16, 17 and 20.

**Table 4-3**  
**Enhanced Bus Alternative Change in Vehicle Operations and Vehicle Cost Drivers\***

LINE	NAME	ANNUAL Δ MILES	ANNUAL Δ HOURS	Δ MAXIMUM OPERATED VEHICLES
<b>Local Bus Service</b>				
16/17	Edgewater–Marina	58,887	3,630	1
20	Marina–Monterey	(666,091)	(32,549)	(6)
<b>Enhanced Bus Service</b>				
20	Marina–Monterey	1,045,624	54,248	10

\*Change from background bus (no-build) alternative

Source: Parsons

In order to handle the maintenance and layover needs of the additional buses associated with this alternative, expansion of MST’s proposed Frank J. Lichtanski Monterey Bay Operations Center at Fort Ord is assumed.

**4.2.3 Bus Guideway Alternatives (BRT-1 and BRT-2)**

Bus rapid transit service would entail the construction of a bus-only roadway located predominately along the Monterey Branch Line right-of-way between Castroville and Monterey. BRT could be implemented in two phases. Alternative BRT-1 includes only the first phase, which utilizes the Monterey Branch Line railroad corridor between Monterey and North Marina. Bus service on existing mixed flow surface roadways would connect North Marina with Castroville. Alternative BRT-2 includes both the first phase, analyzed as BRT-1, as well as the second phase, which utilizes the Monterey Branch Line railroad corridor to extend fixed-guideway bus service from North Marina to Castroville. Therefore, the two alternatives are each briefly presented below, followed by a discussion of system properties generally applicable to both alternatives, with text indicating whether the system properties are unique to LRT-1, LRT-2, or associated with both alternatives.

**4.2.3.1 BRT-1 Project Alignment**

In this alternative, the proposed construction limits would extend between an end of line station in downtown Monterey at Portola Plaza and a North Marina station. Advanced-design, articulated buses would operate over the guideway, providing BRT service. Portions of a pedestrian/bicycle trail that were built on top of the Monterey Branch Line track within the Cities of Monterey and Seaside would be laterally shifted. Connecting transit service to the planned commuter rail station in Castroville would be provided via Route 27, an existing local bus route operating between Marina and Watsonville via Castroville.

The BRT-1 alignment is shown in **Figure 4-3**.

#### 4.2.3.2 *BRT-2 Project Alignment*

In addition to the 10 miles of the Monterey Branch Line discussed above under BRT-1, BRT-2 would depart from the Monterey Branch Line on the north edge of Marina, utilizing Monte Road for about 1.3 miles between Del Monte and Nashua Road and cross the Salinas River, before returning to the Monterey Branch Line right-of-way south of Nashua Road. Such a route would allow local service to/from Castroville as well as connecting to the commuter rail extension serving Pajaro, Castroville, and Salinas, without reconstructing the Salinas River Bridge. Portions of the guideway in Castroville would be single lane where right-of-way constrictions exist adjacent to the UPRR Coast Line tracks.

The BRT-2 alignment is shown in **Figure 4-4**.

#### 4.2.3.3 *Stations/Stops*

Local BRT service on the Monterey Branch Line would be coupled with stations serving all population, employment, and educational concentrations along the Monterey Peninsula corridor. In Alternatives BRT-1 and BRT-2, five stops are proposed to serve Marina at Marina Green Drive, Beach Road, Reservation Road, Palm Avenue and University<sup>1</sup>. Three stops are proposed for Seaside/Sand City at First Street, Playa Avenue, and Contra Costa Street. In Monterey, five stops are proposed: Casa Verde Way, Naval Postgraduate School, El Estero Park, Figueroa Street, and Portola Plaza.<sup>2</sup> Note that the initial alternative definition also included a Canyon del Rey station in Seaside. However this station was removed because of its proximity to the nearby Contra Costa Street station. All modeling and further analysis does not include this station, however it is included in the initial capital cost estimate, discussed in Section 5.5.1.

In Alternative BRT-2, bus rapid transit service would also serve two Castroville stations at Blackie Road and SR-156. Peninsula travelers could transfer to commuter rail and intercity trains in Castroville.

See Section 4.2.5 for a more detailed description of station elements and locations.

#### 4.2.3.4 *Operations*

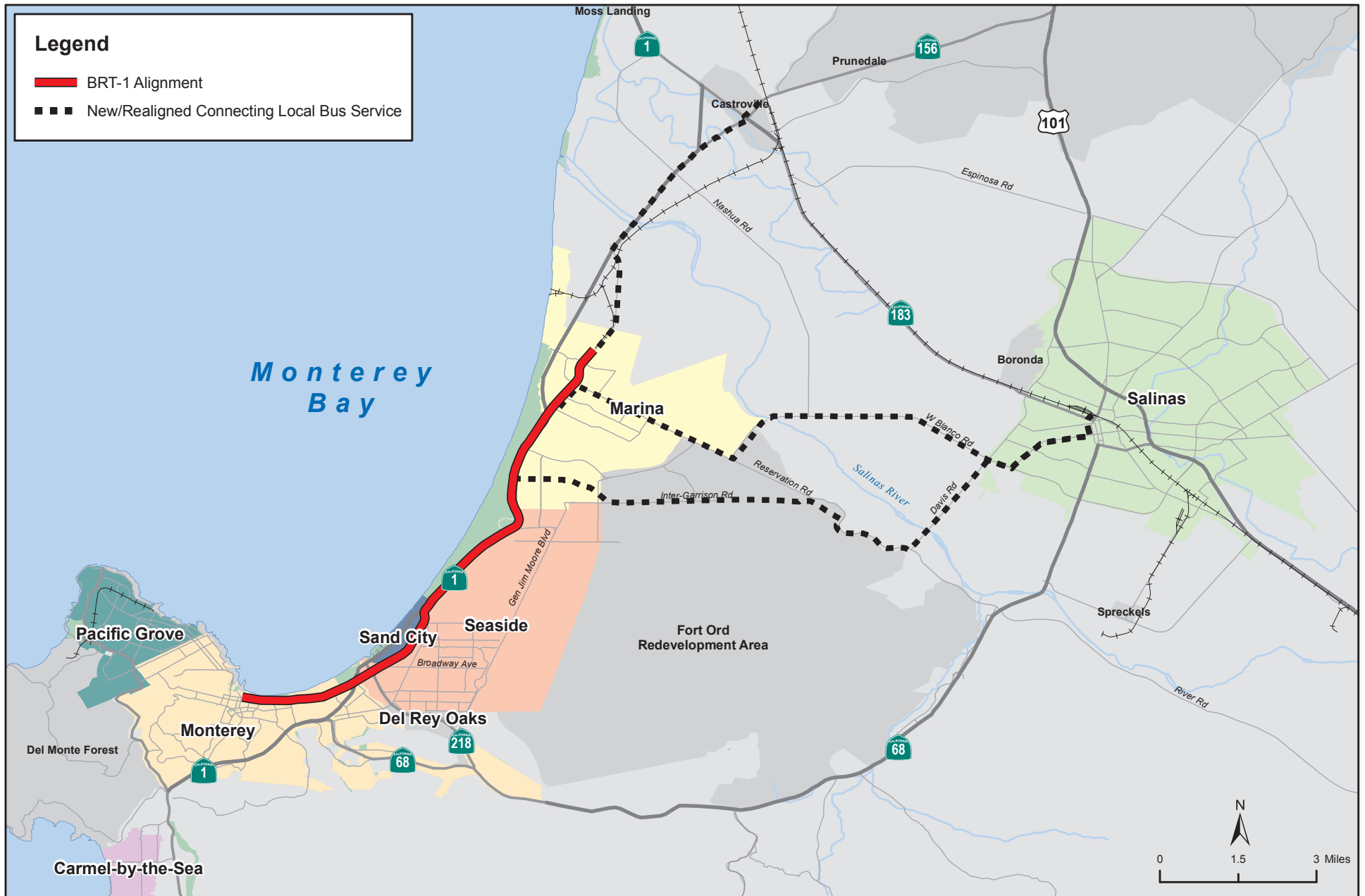
Advanced design articulated buses would operate over the guideway, providing bus rapid transit service. Portions of the guideway would be single lane where potential right-of-way constrictions exist. Bus rapid transit vehicles crossing through street intersections would be protected by traffic signals or railroad gates, flashing lights, and audible warning devices. The service would provide 12 minute peak headways, and 30 minute off-peak headways, running from 5:00 a.m. to midnight. Twelve-minute headways represent the maximum allowable in the corridor given the proposed conceptual design. Vehicles would be diesel, liquid or compressed natural gas, or hybrid fuel powered.

In both BRT-1 and BRT-2, the proposed local service would operate BRT vehicles over the Monterey Branch Line guideway every 10 to 30 minutes in each direction as demand warrants.

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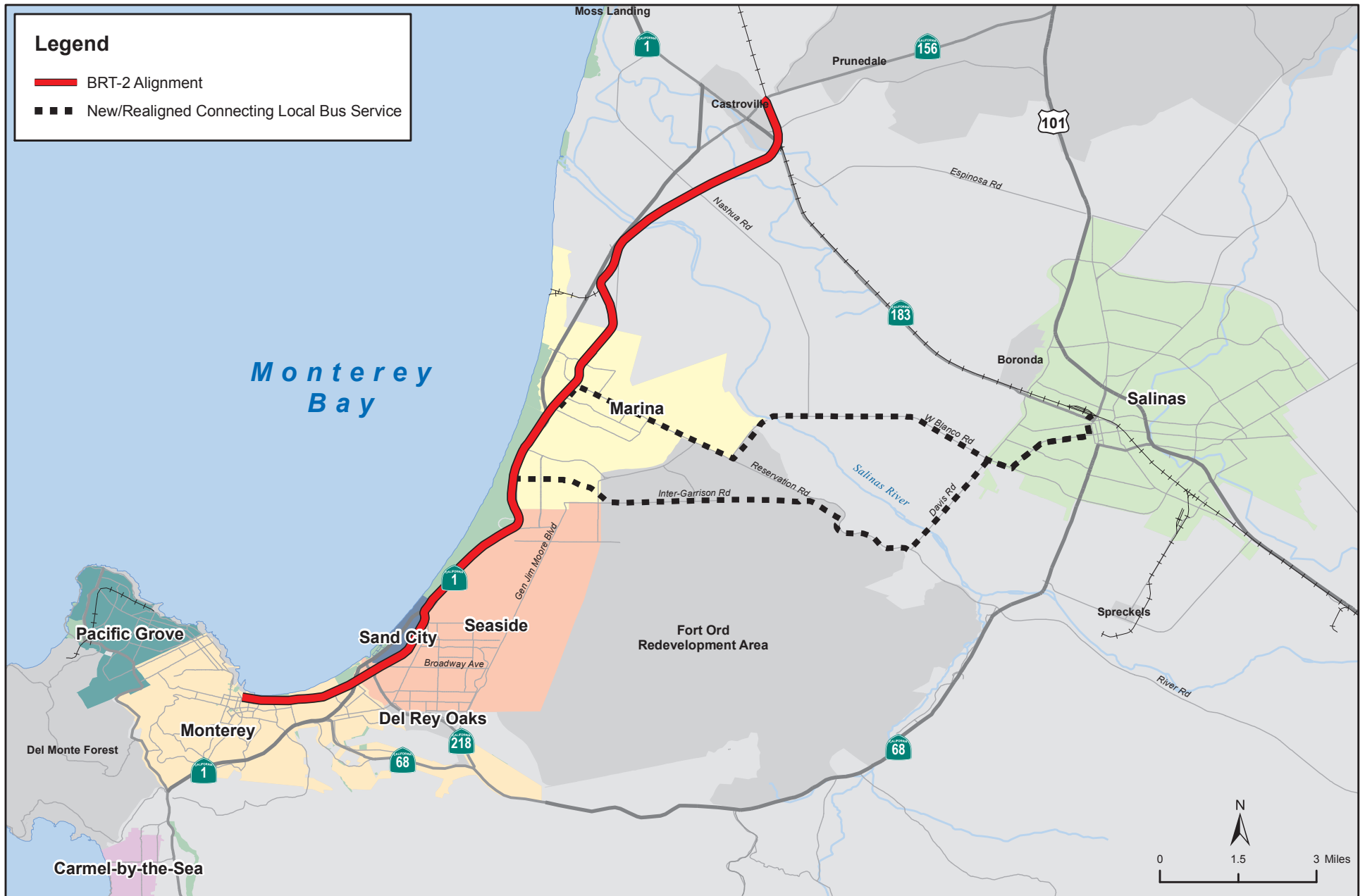
<sup>1</sup> Later renamed the Eight Street Station

<sup>2</sup> Later relocated and renamed the Custom House Plaza Station



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FIGURE 4-3  
BRT-1 ALTERNATIVE ALIGNMENT



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FIGURE 4-4  
BRT-2 ALTERNATIVE ALIGNMENT

The service is planned to have a similar passenger fare as MST regional routes. As of Fiscal Year 2007, the average fare per boarding on MST routes was \$1.29. The end-to-end running time between Castroville and downtown Monterey (BRT-2) is 37.6 minutes, excluding schedule recovery, and potential traffic signal delays at heavily utilized intersections. Taking these factors into account, 45 minutes of platform time per direction is assumed, yielding a vehicle requirement of nine vehicles in maximum operation for this 16.0 mile long route with 10 minute headways; or eight vehicles in maximum operation to provide 12-minute headways.

The shorter route option between downtown Monterey and north Marina (BRT-1), the minimum operating segment, is 10.0 miles in length. One way run time excluding schedule recovery, et al, is 27.2 minutes. Taking schedule recovery and potential traffic signal delays into account, 36 minutes of platform time per direction is assumed, yielding a vehicle requirement of six vehicles in maximum operation for 12 minute headways. (Operating this service over local roads to Castroville would require two additional vehicles.)

Both BRT-1 and BRT-2 service would replace a significant portion of Route 20 which operates on 20-minute headways between Marina and Monterey over Del Monte Boulevard/Avenue, immediately adjacent to the Monterey Branch Line right-of-way, in the no-build alternative. Route 20 would run between the Salinas ITC and Del Monte Boulevard at Reindollar Road in downtown Marina, providing access to both the Reservation and Palm BRT stations. Lines 16/17 would be restructured as described for the enhanced bus alternative. A new local bus route would operate with 30-minute headways along Intergarrison Road, connecting the Eighth Street Transit Center, located near the University LRT Station, with the Salinas Intermodal Transportation Center. Route 27, which would provide a connection between the LRT-1 end of line in Marina and the planned commuter rail station in Castroville, is planned to be re-aligned and headways improved in the no-build alternative. This alternative does not propose any further modifications to the route. Changes to operating miles, hours and the number of vehicles associated with this alternative are shown in **Table 4-4**.

**Table 4-4**  
**Bus Rapid Transit Alternative Change in Vehicle Operations and Vehicle Cost Drivers\***

LINE	NAME	ANNUAL Δ MILES	ANNUAL Δ HOURS	Δ MAXIMUM OPERATED VEHICLES
<b>Local Bus Service</b>				
16/17	Edgewater–Marina	58,887	3,630	1
20	Salinas–Monterey	(333,045)	(16,275)	(3)
New	Marina–Salinas	222,030	10,850	2
<b>Bus Rapid Transit Service</b>				
BRT-1	Monterey–Marina	690,000	34,500	6
BRT-2	Monterey–Castroville	920,000	46,000	8

Source: Parsons

\*Change from background bus (no-build) alternative



#### 4.2.3.5 Maintenance

In order to handle the maintenance and layover needs of the additional buses associated with this alternative, expansion of MST's proposed Frank J. Lichtanski Monterey Bay Operations Center at Fort Ord is assumed.

#### 4.2.3.6 Systems

No communications systems are planned for the Monterey Peninsula Service. Communications between a dispatcher and the cab operators could be via two-way radio or cell phone. These are not significant cost items.

NextBus<sup>®</sup> is an optional item, but is assumed for the purposes of the project cost estimate. This is a system that keeps track of vehicle locations and conveys anticipated arrival times to individual stations. The system consists of a central computer operated and maintained by NextBus, on-board transmitters so that GPS satellites can track the locations, and station-mounted message boards. Data is transmitted via the internet.

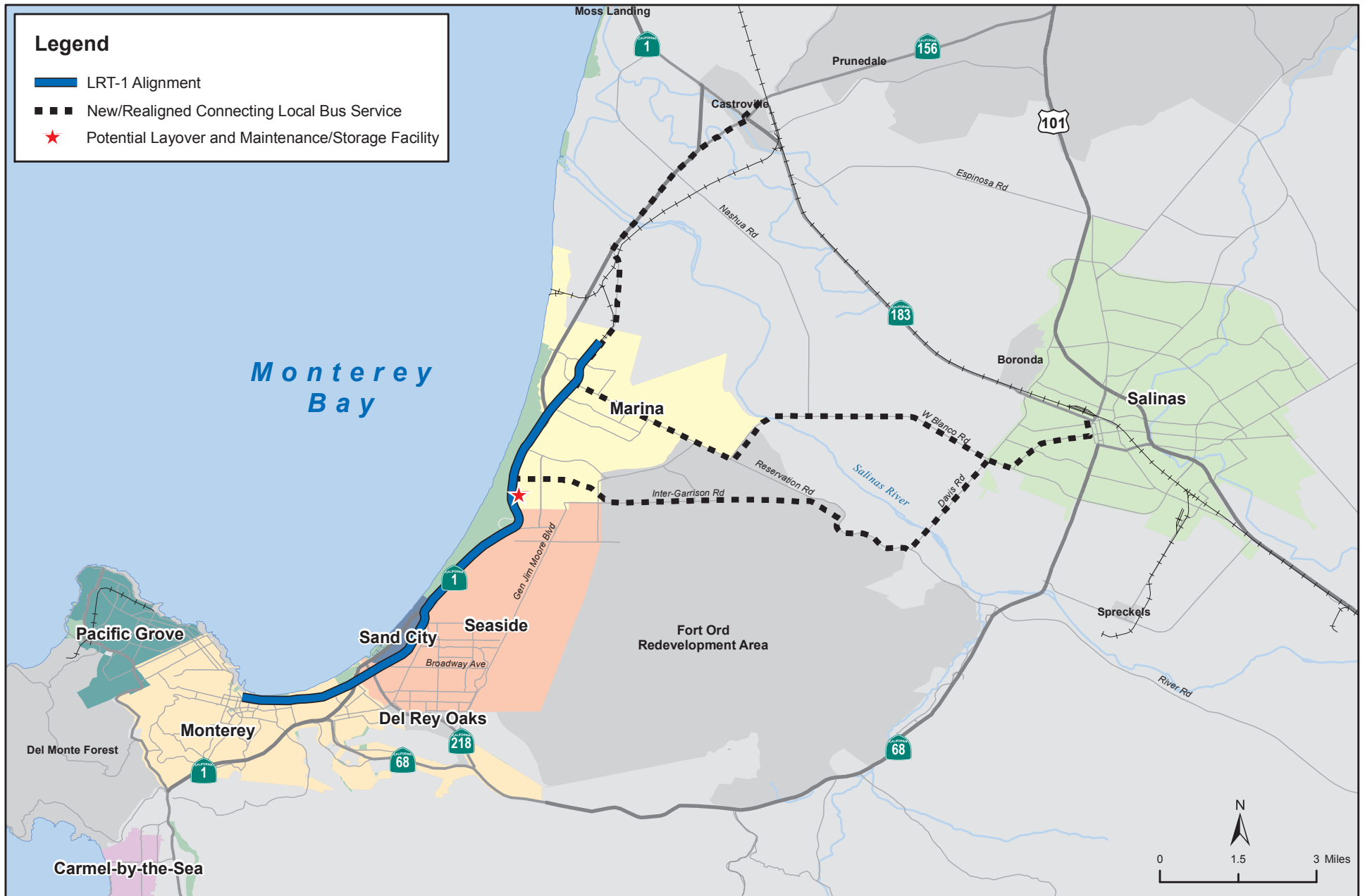
### 4.2.4 Rail Guideway Alternatives (LRT-1 and LRT-2)

LRT could be implemented in two phases. Alternative LRT-1 includes only the first phase, which utilizes the Monterey Branch Line corridor between Monterey and North Marina. Bus service would connect North Marina with Castroville. Alternative LRT-2 includes both the first phase, analyzed as LRT-1, as well as the second phase, which utilizes the Monterey Branch Line corridor between North Marina and Castroville. The two alternatives share identical system features between Monterey and Marina. Therefore, the two alternatives are each briefly presented below, followed by a discussion of system properties generally applicable to both alternatives, with text indicating whether the system properties are unique to LRT-1, LRT-2, or associated with both alternatives.

#### 4.2.4.1 LRT-1 Project Alignment

In this alternative, the Monterey Branch Line railroad track would be restored or constructed between downtown Monterey at Portola Plaza and North Marina, with bus service continuing to Castroville on local roadways. All bridges would be replaced except the span crossing Roberts Lake in Seaside. A single-track line with new ties, ballast and grade crossing protection would be constructed for a distance of 10.0 miles in the first phase. Existing track within the Fort Ord area (laid in 1971) would be reused. Passing sidings would be constructed where needed to allow for two-way train operations. This alternative also includes associated modifications to the no-build bus network to provide enhanced service between the alignment and Salinas, as further described in Section 4.2.1. Connecting transit service to the planned commuter rail station in Castroville would be provided via Route 27, an existing local bus route operating between Marina and Watsonville via Castroville.

The LRT-1 alignment is shown in **Figure 4-5**.



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FIGURE 4-5

LRT-1 ALTERNATIVE ALIGNMENT

#### 4.2.4.2 LRT-2 Project Alignment

The second alternative would include the guideway restoration of 6.0 miles, in addition to the alignment defined as LRT-1 (for a total of 16.0 miles), to the planned Castroville intercity rail station near SR-156. This alternative would require modification of the proposed Castroville commuter rail station to accommodate a Monterey Branch Line separate station track for non-FRA-compliant vehicles. This alternative also includes associated modifications to the no-build bus network to provide enhanced service between the alignment and Salinas, as further described in Section 4.2.1.

The LRT-2 alignment is shown in **Figure 4-6**.

#### 4.2.4.3 Stations/Stops

Stations would be placed to serve all existing and projected population, employment, and educational concentrations along the Peninsula. For Alternatives LRT-1 and LRT-2, five stops are proposed to serve Marina at Marina Green Drive, Beach Road, Reservation Road, Palm Avenue and University<sup>3</sup>. Three are proposed to serve Seaside and Sand City at First Street, Playa Avenue, and Contra Costa Street. In Monterey, five stops are proposed: Casa Verde Way, U.S. Naval Postgraduate School, El Estero Park, Figueroa Street, and Portola Plaza<sup>4</sup>. Note that the initial alternative definition also included a Canyon del Rey station in Seaside. However this station was removed because of its proximity to the nearby Contra Costa Street station. All modeling and further analysis does not include this station, however it is included in the initial capital cost estimate, discussed in Section 5.5.1.

In Alternative LRT-2 only, light rail transit service would also serve two Castroville stations at Blackie Road and SR-156. Peninsula travelers could transfer to commuter rail and intercity trains in Castroville. This alternative would additionally require modification of the proposed Castroville commuter rail station to accommodate a Monterey Branch Line separate station track for non-FRA-compliant vehicles.

See Section 4.2.5 for a more detailed description of station elements and locations, including a map of the station locations.

#### 4.2.4.4 Operations

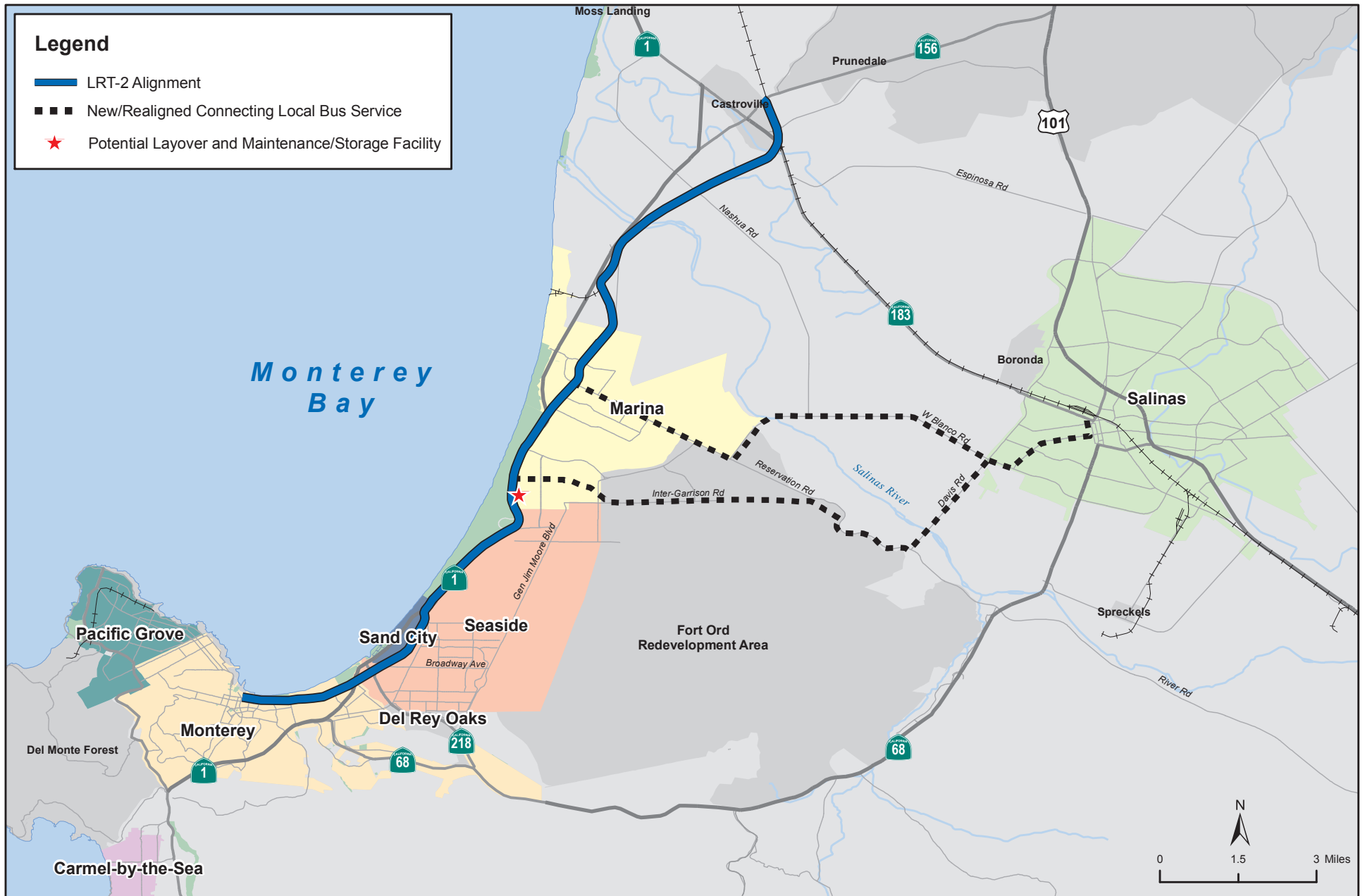
In Alternative LRT-1, light rail transit service would operate between Monterey and Marina. The service would provide twelve minute peak headways, and 30 minute off-peak headways, running from 5:00 a.m. to midnight. Twelve minute headways represent the maximum allowable in the corridor given the proposed conceptual design. Use of diesel electric single car train consists are assumed for the light rail transit service. All train equipment would be interchangeable, thereby minimizing requirements for spare vehicles

In Alternative LRT-2, light rail transit service would operate at similar headways and span as LRT-1, but between Monterey and Castroville, with transfers to commuter rail and Amtrak trains at the Castroville Station.

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<sup>3</sup> Later renamed the Eight Street Station

<sup>4</sup> Later relocated and renamed the Custom House Plaza Station



Kimley-Horn  
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FIGURE 4-6

LRT-2 ALTERNATIVE ALIGNMENT

The service is planned to have a similar passenger fare as MST regional routes. As of Fiscal Year 2007, the average fare per boarding on MST routes was \$1.29.

The end-to-end running time for the 10-mile-long downtown Monterey to northern Marina segment (LRT-1) is 27.7 minutes one way, excluding schedule recovery and potential traffic signal delays at the California Avenue and SR-1 ramp terminal intersection in Seaside/Sand City, the track crossing of Canyon del Rey Boulevard in Seaside, and the intersection of Lighthouse and Del Monte Avenue in downtown Monterey. Taking these time allowances into account, 36 minutes of platform time per direction is assumed. This yields a vehicle requirement of six one-car train consists in maximum operation for 12 minute headways.

The end-to-end running time between Castroville and downtown Monterey (LRT-2) is 39.2 minutes. Taking schedule recovery and potential traffic signal delays into account, 48 minutes of platform time per direction is assumed, yielding a vehicle requirement of eight one-car train consists.

Insofar as supporting bus service changes, Lines 16/17 would be altered as defined for the enhanced bus alternative and Line 20 would be shortened to run between Del Monte Boulevard at Reindollar Avenue and downtown Salinas over the existing alignment, providing access to both the Reservation and Palm LRT stations. A new local bus route would be introduced along Intergarrison Road, connecting the Eighth Street Transit Center, located near the University LRT Station, with the Salinas Intermodal Transportation Center. Taking schedule recovery into account, 30 minutes of platform time per direction is assumed for this new service, yielding a vehicle requirement of two vehicles in maximum operation for 30-minute headways. Route 27, which would provide a connection between the LRT-1 end of line in Marina and the planned commuter rail station in Castroville, is planned to be re-aligned and headways improved in the no-build alternative. This alternative does not propose any further modifications to the route. **Table 4-5** depicts the change in vehicle operations with these alternatives. The modified local bus service alignments are depicted back on **Figures 4-5** and **4-6**.

**Table 4-5**  
**Light Rail Transit Alternative Change in Vehicle Operations and Vehicle Cost Drivers\***

LINE	NAME	ANNUAL Δ MILES	ANNUAL Δ HOURS	Δ MAXIMUM OPERATED VEHICLES
<b>Light Rail Transit Service</b>				
LRT-1	Monterey–Marina	575,000	34,500	6
LRT-2	Monterey–Castroville	920,000	46,000	8
<b>Local Bus Service (both LRT-1 and LRT-2)</b>				
16/17	Edgewater–Marina	58,887	3,630	1
20	Marina–Monterey	(333,045)	(16,275)	(3)
New	Marina-Salinas	222,030	10,850	2

\*Change from background bus (no-build) alternative  
Source: Parsons

#### 4.2.4.5 Maintenance

For LRT-1 and LRT-2, a layover facility for inspection and maintenance would be constructed east of SR-1 on TAMC/MST lands formerly used for Fort Ord quartermaster warehousing. This facility would be



accessed via the Fifth Street undercrossing of SR-1. The location of this facility is depicted back on **Figures 4-5** and **4-6**.

#### 4.2.4.6 Systems

Alternatives LRT-1 and LRT-2 are planned to run without train signals. Trains would be diverted to passing sidings with spring switches. Some signals will be needed at track junctions and crossings. The signals proposed would consist of wayside signal masts at the specific locations. At motorized turnouts, the signals would display the orientation of the switch points as set by the operator using the wayside push buttons.

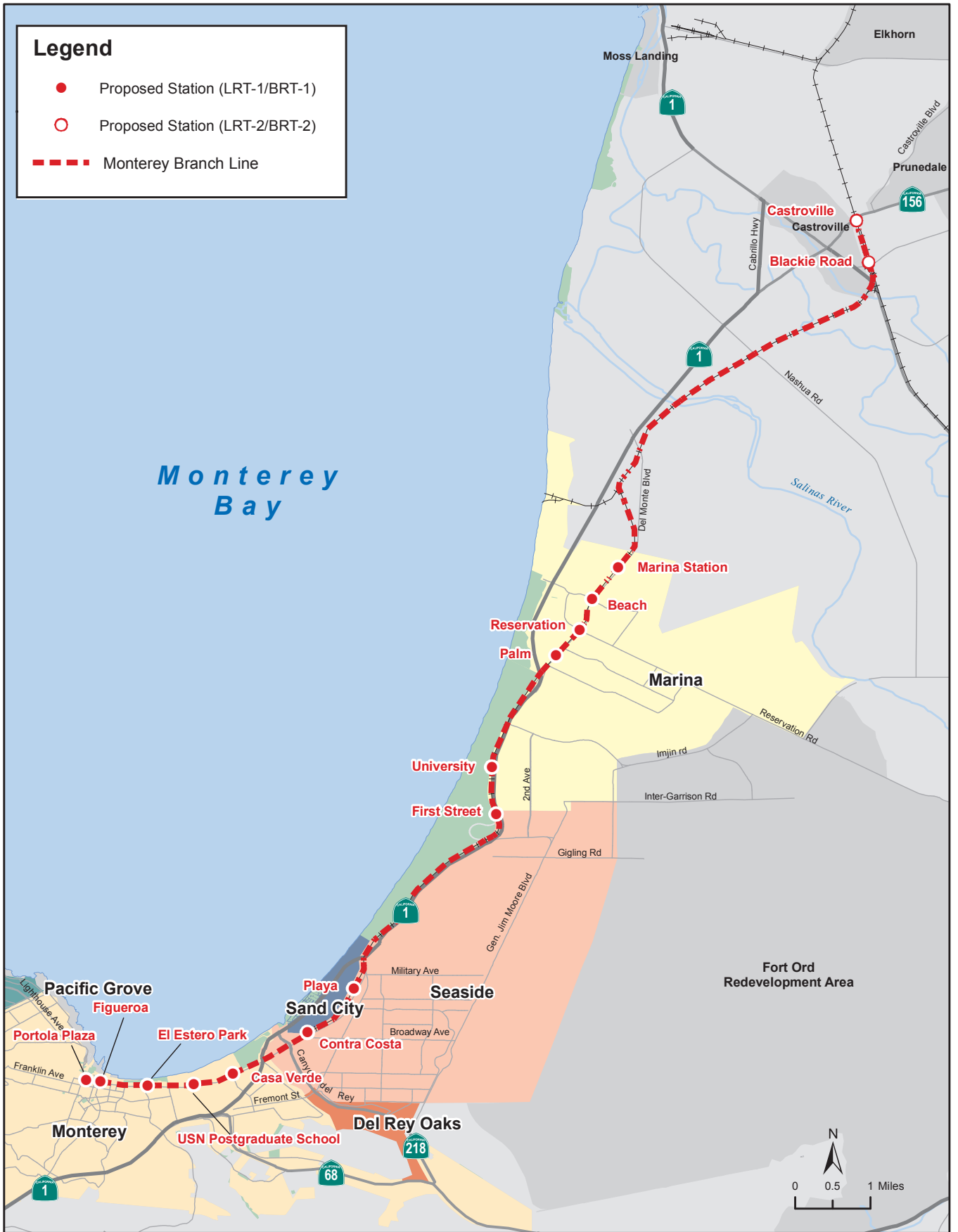
Automatic block signaling is an optional item. This is the simplest form of railroad signals and consists of wayside signals activated by track circuits to prevent trains from getting too close to each other. This does not replace procedures for authorizing trains to occupy segments or blocks of track, similar to an unsignaled railroad.

No communications systems are planned for the Monterey Peninsula Service. Communications between a dispatcher and the cab operators could be via two-way radio or cell phone. These are not significant cost items.

NextBus<sup>®</sup> is an optional item, but is assumed for the purposes of the project cost estimate. This is a system that keeps track of vehicle locations and conveys anticipated arrival times to individual stations. The system consists of a central computer operated and maintained by NextBus, on-board transmitters so that GPS satellites can track the locations, and station-mounted message boards. Data is transmitted via the internet.

#### 4.2.5 Stations

Station locations for all four build alternatives are described in **Table 4-6** and shown on **Figure 4-7**. Station locations are identical between LRT-1 and BRT-1. LRT-2 and BRT-2 alternatives both include all LRT-1/BRT-1 stations, as well as two additional stations in Castroville.



**Table 4-6**  
**Potential Monterey Branch Line Fixed-Guideway Transit Stations**

STATION	CITY	STOP LOCATION	DISTANCE TO SUBSEQUENT STATION (MILES)	PARKING
Stations for LRT-2 and BRT-2 Only				
1. Castroville	Castroville	North of SR 156	0.65	Yes
2. Blackie Road	Castroville	North of Crossing	5.32	No
Stations for LRT-1, LRT-2, BRT-1 and BRT-2				
3. Marina Station	Marina	North of Marina Green Drive	0.54	Yes
4. Beach	Marina	North of Beach Road	0.57	No
5. Reservation	Marina	South of Reservation Road	0.37	No
6. Palm	Marina	South of Palm Avenue	1.70	Yes <sup>1</sup>
7. University <sup>2</sup>	Marina	Eighth Street	0.58	Yes
8. First Street	Seaside	North of First Street	2.90	No
9. Playa	Seaside/Sand City	North of Playa Avenue	0.87	Yes
10. Contra Costa	Seaside/Sand City	West of Contra Costa Street	0.89	No
11. Casa Verde	Monterey	East of Casa Verde Way	0.46	Yes
12. Naval Postgraduate	Monterey	Opposite Main Gate	0.61	Yes <sup>1</sup>
13. El Estero Park <sup>3</sup>	Monterey	East of La Playa Avenue	0.26	No
14. Figueroa	Monterey	West of Figueroa Street	0.27	Yes
15. Portola Plaza <sup>4</sup>	Monterey	At Alvarado Street		No

<sup>1</sup> Includes pick-up/drop-off area

<sup>2</sup> Later renamed the Eighth Street Station

<sup>3</sup> Later combined with the Naval Postgraduate Station

<sup>4</sup> Later relocated and renamed the Custom House Plaza Station

Source: Parsons

Each station would consist of a low-level platform with passenger amenities. One stand alone (i.e., no communications connections) ticket vending machine would be installed on each platform. Park and ride lots are proposed for construction at the stations identified in **Table 4-6**. The size of each lot would be based on the projected demand at each station and each alternative. Specific locations have been conceptually identified. Additional parking in the already-planned lots at Castroville and Salinas would be constructed. Bicycle and walk access to the proposed stations would be strongly encouraged and supported with bicycle storage lockers and pedestrian walkway access improvements.

At the two stations in the Fort Ord area at Eighth and First Streets, vertical transportation will be needed to the adjacent streets. A staircase and an elevator are assumed at each location.

#### **4.2.6 Monterey Branch Line Corridor Setting and Improvements**

All four build alternatives utilize at least a portion of the Monterey Branch Line corridor. Alternatives LRT-1 and BRT-1 use the portion of the corridor extending between Monterey and Marina. Alternatives LRT-2 and BRT-2 use the portion of the corridor extending between Monterey and Castroville. The following briefly describes the existing corridor setting and improvements proposed for implementation of the specified alternatives. The enhanced bus alternative does not utilize the Monterey Branch Line corridor, instead using mixed-flow surface streets. Therefore, the improvements identified in this section are not applicable for implementation of the enhanced bus alternative. For a more detailed discussion of

the corridor, abutting, land uses, and necessary civil improvements, please refer to Alternatives Analysis Volume 1, Chapter 2.

The Monterey Branch Line originally extended from Del Monte Junction (Castroville) to Lake Majella in Pacific Grove, a distance of approximately 20 miles. The track that remains is generally in unusable condition. The one exception is about two miles within the boundaries of the former Fort Ord military reservation, which was realigned in the 1960's and thus is in excellent condition. In this segment, the adjacent lands southeast of SR-1 are owned by TAMC.

The portion of the Branch Line right-of-way which is owned by TAMC terminates just east of Contra Costa Street within the limits of Sand City. Thereafter, the right-of-way is owned by the cities of Seaside and Monterey. The right-of-way width narrows to about 80 feet near the Naval Post Graduate School and at the west end, the original corridor right-of-way widens to about 400 feet in the old Monterey station area, between Camino El Estero and Washington Street.

The California Public Utilities Commission has jurisdiction over the installation of highway-railroad grade crossings, including pedestrian crossings. A permit is needed from CPUC to install or modify any public grade crossing. For the LRT and BRT guideway alternatives, intersections of the track or busway with cross streets would be controlled by gates as a safety precaution. Signals at adjacent intersections would be preempted to prevent waiting traffic from blocking the transit guideway. New signals with pre-emption would be constructed at Roberts Avenue in Monterey. See Alternatives Analysis Volume 1, Chapter 2 for identification and discussion of each grade crossing associated with the project alternatives. Additional street improvements consist of guard rail at specific locations shown on the conceptual design drawings.

Very little earthwork other than grading is anticipated for this project. Embankment will be required for the track approaching the new Salinas River Bridge, applicable to only LRT-2. There is also some minor excavation and embankment required for the local service track adjacent to the main line just south of Castroville, also applicable to only LRT-2 and BRT-2. Very little drainage improvements other than the replacement of the five timber trestles and the improvements to or replacement of the Salinas River Bridge are needed.

No major utility relocations have been identified along the Branch Line. For LRT-2 and BRT-2, it is assumed that TAMC would work out an arrangement with UPRR to relocate fiber optic lines running on both sides of the UPRR Coast main line track.

The existing recreation trail southwest of Canyon Del Rey Boulevard will be used as much as possible in conjunction with and adjacent to the restored rail line or busway. The recreation trail will be reconstructed at various locations where its current location conflicts with the proposed railroad track alignment. The locations of the relocated segments of the recreation trail were selected to minimize grade crossings of the track. See Alternatives Analysis Volume 1, Chapter 2 for a full description of the modified recreational trail alignment.

## 5.0 Evaluation of the Alternatives

During this analytical phase, many technical studies and numerous qualitative and quantitative analyses were performed on the final set of alternatives. These studies helped provide a refined definition of the operational and physical characteristics of each alternative. In addition, the information gathered facilitated the assessment of individual alternatives on a comparative basis as part of the alternatives analysis process. The studies performed included:

- Constructability
- Compatibility with Land Use and Demographics
- Environmental, noise and vibration, and traffic impact analysis
- Travel demand in the corridor and transit ridership forecasts
- Estimation of capital, operating and maintenance costs
- Financial capacity analysis

With the supporting studies complete, the results are used to assess the travel benefits, costs, and impacts of the proposed alternatives. Key trade-offs among the alternatives are evaluated and discussed.

### 5.1 Constructability

**Structures.** The placement and construction of structures required for the proposed project is not deemed to be particularly significant for alternatives LRT-1 or BRT-1. In the case of LRT-2 and BRT-2, more significant restoration must be completed on a number of small structures, with more extensive construction needed in the case of LRT-2 to replace the Salinas River Bridge.

**Systems.** There are no significant problems seen insofar as systems characteristics are concerned, expect that additional facilities would be required in the case of the rail options. The base case rail alternatives (LRT-1 and LRT-2) are planned to run without train signals. For LRT-1 and LRT-2, a layover facility for inspection and maintenance would be constructed east of SR-1 on TAMC/MST lands formerly used for Fort Ord quartermaster warehousing for both rail alternatives.

Between Blackie Road and the proposed Castroville intercity rail station, the fixed-guideway would travel within the Union Pacific Railroad (UPRR) right-of-way and be subject to terms and conditions as negotiated by and agreed upon by the project sponsor and the UPRR.

The dunes area just north of the Naval Postgraduate School provides a potential challenge in that alternatives requiring a double-lane busway (BRT-1 and BRT-2) would utilize right-of-way width to the extent that the existing recreation trail would have to be relocated horizontally and vertically to a point somewhere along the side slope of these dunes. Alternately, the existing grove of eucalyptus trees alongside the trail would need to be diminished.

**Street/Grade Crossings.** Because no grade separations are proposed as part of this project, all points where the proposed guideway will intersect local roadways will be at-grade. At grade intersections are subject to rigorous safety, warning, and operational requirements to ensure smooth and safe operations. Though at least partially significant with any mode, the rail option is deemed more significant due to the nature, size, and stopping distances required of rail vehicles. While at least partially significant, these



issues can be fully mitigated. It should be further noted that while neither Caltrans nor the Public Utilities Commission (PUC) have raised any issues thus far, potential traffic/transit conflict issues could be raised concerning the Canyon del Rey (SR 218) and California Avenue (SR-1 ramps) crossings.

Table 5-1 summarizes the findings of the constructability analysis.

**Table 5-1**  
**Constructability Significance of Build Alternatives**

IMPACT	ALTERNATIVES			
	BRT-1	BRT-2	LRT-1	LRT-2
Trackwork/Guideway	○	◐	○	◐
Street/Grade Crossings	◐	◐	◐	◐
Structures	○	◐	○	●
Stations/Platforms	○	○	○	○
Systems	◐	◐	◐	◐
Utilities	○	○	○	○
Right-of-Way	○	○	○	○

○ Not significant    ◐ Possibly Significant    ● Significant

## 5.2 Compatibility with Land Use and Demographics

Adequate regulations, requirements, and guidelines are in place in each of the four Peninsula cities such that transit-oriented development is not only supported but highly encouraged. For a detailed description of those adopted policies, please refer to Alternatives Analysis Volume 1, Chapter 3. Public and private agencies possess the statutory and administrative tools to achieve transit-oriented development goals. There is also support in this regard from county and state agencies. Transit-oriented zoning designations and planning policies which can be used to shape and direct future growth along the proposed project corridor are crucial to the project’s ultimate effectiveness and flexibility.

Future growth is relatively certain along the Monterey Peninsula over both the near- and long-term. Further, the density of existing and expected future housing, jobs, low-income, and transit-dependent residents in this area occurs in very close proximity to the proposed fixed-guideway corridor. The prospects for a reasonably sized transit market, especially between Monterey and Marina appears viable. Lack of population, households, and expected future development or land use changes in the general area between north Marina and Castroville reduces the market for transit in this segment, except for growth generated in Castroville as a result of the Castroville Community plan, and connections to existing

Amtrak passenger rail service and planned future services (Coast Daylight and the extension of commuter rail to Salinas). Because of this reduction in density north of Marina, build alternatives BRT-2 and LRT-2 received a lower rating than BRT-1 and LRT-1.

**Table 5-2** provides a summary of the demographic projections and land use findings. The table indicates that the corridor served by BRT-1 and LRT-1, between downtown Monterey and north Marina, is more conducive to fixed-guideway transit service compared with the extension of the corridor segment between north Marina and Castroville.

**Table 5-2**  
**Demographic and Land Use Significance of Build Alternatives**

IMPACT	ALTERNATIVES			
	BRT-1	BRT-2	LRT-1	LRT-2
Population	●	◐	●	◐
Households	●	◐	●	◐
Low-Income Households	●	●	●	●
Employment	●	◐	●	◐
Current Land Uses	●	◐	●	◐
Future Land Uses	●	◐	●	◐
Transit-Supportive Policies	●	◐	●	◐

○ Least Supportive    ◐ Partially Supportive    ● Most Supportive

### 5.3 Environmental Considerations

Please refer to Alternatives Analysis Volume 1, Chapter 4, for a discussion of the environmental setting and identification of the potential impacts associated with each of the analyzed alternatives. Described below is a brief summary of the environmental considerations.

**Water Quality.** Two of the four alternatives (BRT-2 and LRT-2) would require five timber trestle bridges to be rebuilt or replaced. Three of the five bridges span distinct waterways and would require a water quality study under the BRT-2 and LRT-2 alternatives. The LRT-2 alternative would also likely require the construction of a new, 715-foot long bridge over the Salinas River. With the BRT-2 alternatives, this bridge would not be required, as the rubber tired vehicles could use the adjacent Monte Road Bridge. The construction of the new bridge under LRT-2 would require a water quality study and permits from the U.S. Army Corps of Engineers, the U.S. Coast Guard, the Central Coast Regional Water Quality Control Board, and the California Department of Fish and Game.

**Coastal Zone.** A portion of the project is located within the Coastal Zone. Compliance with California Coastal Commission and Local Coastal Program Goals would therefore be required. Possible conflicts include potential biological impacts.

**Biology.** The possible presence of steelhead trout in the Salinas River would need to be determined in consultation with the U.S. Fish and Wildlife Service. A biological assessment was conducted in 2003, covering the portion of the corridor between Marina and Monterey. Should the LRT-2 alternative be selected and a new bridge built across the Salinas River, a Section 7 consultation and biological assessment will need to be performed, and an Incidental Take Permit may be necessary. The Monterey Bay Dunes complex, located on the seaward side of the project corridor in the Fort Ord area is considered an environmentally sensitive habitat area, home to several native plants that are already listed, or are on the candidate list, on the federal register of endangered and threatened species. The Seaside bird's beak is protected under the California Plan Protection Act of 1977 and the Monterey spineflower is listed as an endangered species. In addition, these plants are home to several species of concern. The Western snowy plover, which nests at the Fort Ord Dunes State Park, adjacent to the project corridor, is listed as a threatened species by the U.S. Fish and Wildlife Service. The Smith's blue butterfly is a federally protected animal species listed as endangered by the U.S. Fish and Wildlife Service. The black legless lizard is considered a species of concern by the California Department of Fish & Game. The project site itself, while located adjacent to the Fort Ord Dunes State Park and the dune complex, also has the potential to support rare native animal and plant species. A limited number of buckwheat plants, which support the butterfly habitat, have been found in the past in project corridor. A new biological survey would be required to determine whether the habitat remains. The LRT-1 and LRT-2 alternatives would be least disruptive to the sensitive area, as the alternatives propose to utilize existing railroad track and ties through most of this area. However, the BRT-1 and BRT-2 alternatives would remove the existing railroad track passing through the former Fort Ord area, and replace this track with a 32-foot wide roadway. The construction process and non-porous roadway surface would diminish potential environmentally sensitive habitat acreage.

**Wetlands.** Wetlands are present adjacent to the Monterey Branch Line railroad right-of-way at the Salinas River, Locke-Paddon Park, and Roberts Lake. The four build alternatives construct bus guideway or reconstruct rail track adjacent to these water features.

**Hazardous Materials.** Phase I and Phase II Environmental Site Assessments have been conducted for the portion of the project located between Contra Costa Street and Castroville. Three boring locations were found to contain contaminated soil. Six sites within the alignment area handled or used hazardous materials or waste. These conditions are typical for railroad rights-of-way, and while potentially significant, should not inhibit construction of a fixed-guideway project on the Monterey Branch Line.

**Parklands.** The project alignment runs through or alongside three public parks that have been developed subsequent to the construction of the Monterey Branch Line by Southern Pacific Railroad in 1879. One of the parks includes a bicycle/pedestrian trail that is located within the railroad right-of-way in the City of Monterey. With each alternative, the trail will be laterally shifted to run alongside the track or busway and full use will be retained. A second public park, the Window on the Bay/Monterey Bay Waterfront Park, currently lies within the railroad right-of-way. Alignment deviations are under consideration to minimize

the impact from the project on the park. These two parks were both established with the understanding that the transit services may resume on the railroad corridor. Agreements between the California Department of Transportation and the cities of Monterey and Seaside retain the use of the Monterey Branch Line right-of-way for future fixed-guideway transit service.

**Visual.** A field study would be necessary to determine whether any significant or designated visual resources exist within the project area and whether the project will impact any such resources pursuant to NEPA and CEQA guidelines. The project route includes such resources as views of the ocean and Monterey Bay, sand dunes, and potential historic structures.

**Traffic.** Traffic impacts at highway-rail/busway crossings are potentially significantly at five locations, all of which may be mitigated through use of partial transit priority traffic signal control. Caltrans and the California Public Utilities Commission would need to be consulted with respect to the SR-1/Fremont Boulevard interchange ramp terminals and operations at the Canyon del Rey (SR 218) crossing adjacent to Del Monte Boulevard.

**Noise and Vibration.** Ten single-family residences and three multi-family residences would experience operational noise impact due to operation of LRT vehicles in Alternatives LRT-1 and LRT-2. These impacts could be mitigated with relatively low sound walls. Construction noise impacts may occur due to bridge construction (LRT-2 alternative only), LRT track work (LRT-1 and LRT-2 alternatives only), station/park-and-ride construction, and guideway construction (BRT-1 and BRT-2 alternatives only)

**Table 5-3** provides a summary of the environmental impact findings. Areas of potential or significant impact which could affect implementation of the proposed build alternatives are briefly summarized below.

**Table 5-3  
 Environmental Significance of Build Alternatives**

IMPACT	ALTERNATIVES			
	BRT-1	BRT-2	LRT-1	LRT-2
Water Quality	○	◐	○	●
Coastal Zone	◐	◐	◐	◐
Floodplain	○	○	○	○
Biology	●	●	○	◐
Wetlands	◐	◐	◐	◐
Hazardous Materials	◐	◐	◐	◐
Parklands (4f)	◐	◐	◐	◐
Visual Impacts	○	○	○	○
Relocations	○	○	○	○
Traffic	◐	◐	◐	◐
Cultural Resources	○	○	○	○
State Lands Encroachment	○	○	○	○
Noise and Vibration	○	○	◐	◐
Air Quality	○	○	○	○
Consistency with Community Plans	○	○	○	○

○ Not significant    ◐ Possibly Significant    ● Significant

The environmental significance of each of the build alternatives is generally similar; however, there are a few areas where the various build alternatives differ in their effect on the environment. These differences are highlighted below:

- Water Quality:** Both the BRT-2 and LRT-2 alternatives require the construction of at least three bridges over distinct waterways. LRT-2 has the additional impact of requiring construction of a new bridge over the Salinas River, requiring a number of environmental permits. LRT-1 and BRT-1 do not require any bridge construction or replacement over distinct waterways.
- Biology:** Both the BRT-1 and BRT-2 alternatives require removal of the existing track adjacent to Ford Ord Dunes State Park, and construction of a 32-foot wide non-porous surface. This may disrupt environmentally sensitive habitat, including potential nesting areas for the federally threatened Western snowy plover. The LRT-1 and LRT-2 alternatives will utilize the existing



track for service and would be least disruptive. The LRT-2 alternative however, will require a new bridge over the Salinas River, requiring a Section 7 consultation with the National marine Fisheries Service or the U.S. Fish and Wildlife Service due to the possible presence of steelhead trout in a river.

- **Noise and Vibration:** Operation of the LRT-1 and LRT-2 alternatives may result in a noise impact at a handful of residences along the corridor. There is also the potential for vibration impacts associated with LRT operations to occur at a few residences along the corridor. No noise and vibration impact would be anticipated to result due to BRT operations. All four alternatives may result in a handful of residences experiencing temporary construction noise impacts due to the construction of the guideway and stations. The LRT-2 alternative may result in an additional temporary construction noise impact associated with the construction of the bridge over the Salinas River.

Please refer to Alternatives Analysis Volume 1, Chapter 4, for a more detailed discussion of the potential impacts associated with each of the analyzed alternatives. In the event that any biological or habitat issues are found to exist, they would likely be more extensive in the case of the bus alternatives where the required guideway width is significantly wider. Minor and readily solvable traffic impact and noise issues were identified and addressed.

## 5.4 Ridership

This section presents the ridership forecasts for these alternatives. The *Ridership Model Methodology Report for the Monterey Peninsula Fixed-Guideway Study* describes the basis for these ridership forecasts. The commuter rail extension to Salinas is not assumed in the ridership forecasts. Should that project be implemented within the horizon of this analysis, it is anticipated that it may result in additional transit system ridership not reflected in the ridership projections contained below, particularly for alternatives providing a direct connection to the planned commuter rail stations in Castroville and Salinas.

**Table 5-4** summarizes key ridership forecast statistics. The 2015 forecast provides an estimate of the “opening day” ridership after a reasonable amount of time has elapsed for the system to reach “equilibrium.”

**Table 5-4**  
**Overview of Projected Ridership, 2015**

	2015 NO-BUILD	2015 ENHANCED BUS	2015 BRT-1	2015 BRT-2	2015 LRT-1	2015 LRT-2
Total boardings on the alternative <sup>1</sup>	2,385	3,154	4,288	4,383	4,443	4,426
Total daily transit system boardings	16,645	17,417	19,645	19,739	19,649	19,642
Total daily transit trips <sup>2</sup>	13,698	14,249	15,616	15,699	15,343	15,422

<sup>1</sup> Boardings on all services included in the alternative definition, including any fixed-guideway and feeder bus service, and existing or modified Route 20.

<sup>2</sup> Daily “linked” transit trips made on all modes in the MST service area

Source: Parsons

As shown in **Table 5-4**, the BRT and LRT Build alternatives are forecast to produce a significantly larger number of daily boardings and transit trips. The enhanced bus alternative is forecast to produce substantially less ridership and a lower transit mode share than either of the build alternatives. Some other key findings from the ridership analysis are provided below:

- The increased frequency of service on Line 20, offered by the enhanced bus alternative, increases the number of transit riders on Line 20 by 32 percent. Overall system ridership would increase by 4.6 percent (2015 no-build vs. 2015 enhanced bus).
- Ridership differences among the four build alternatives (BRT-1, BRT-2, LRT-1, LRT-2) are relatively minor ( $\pm 100$  daily system boardings). The ridership model treats LRT and BRT modes as being equal. For transit trips between Salinas and Marina, no travel time advantage exists between the alternatives (no-build, enhanced bus, BRT or LRT).
- The four build alternatives increase overall system ridership (total daily system boardings) by 18 percent compared to the 2015 no-build alternative, and over 13 percent compared with the enhanced bus alternative. In the Line 20 corridor, the build alternatives increase ridership by 82 percent compared to the no-build alternative, and 37 percent compared to the enhanced bus alternative.
- Ridership forecasts do not reflect the extension of commuter rail service between Santa Clara County and Monterey County (Watsonville/Pajaro, Castroville, and Salinas). The construction of this extension would likely increase ridership on all build alternatives, although most significantly on LRT-2 and BRT-2.
- The ridership forecasts do not fully reflect the potential of bicycle access to the fixed-guideway stations, as the bike access mode is not specifically modeled. The provision of bicycle lockers at stations and bicycle-on-board transport would likely increase the accessibility of fixed-guideway transit service to this potential user group.

**Table 5-5** indicates anticipated mode of access to the transit system as a whole for each alternative.

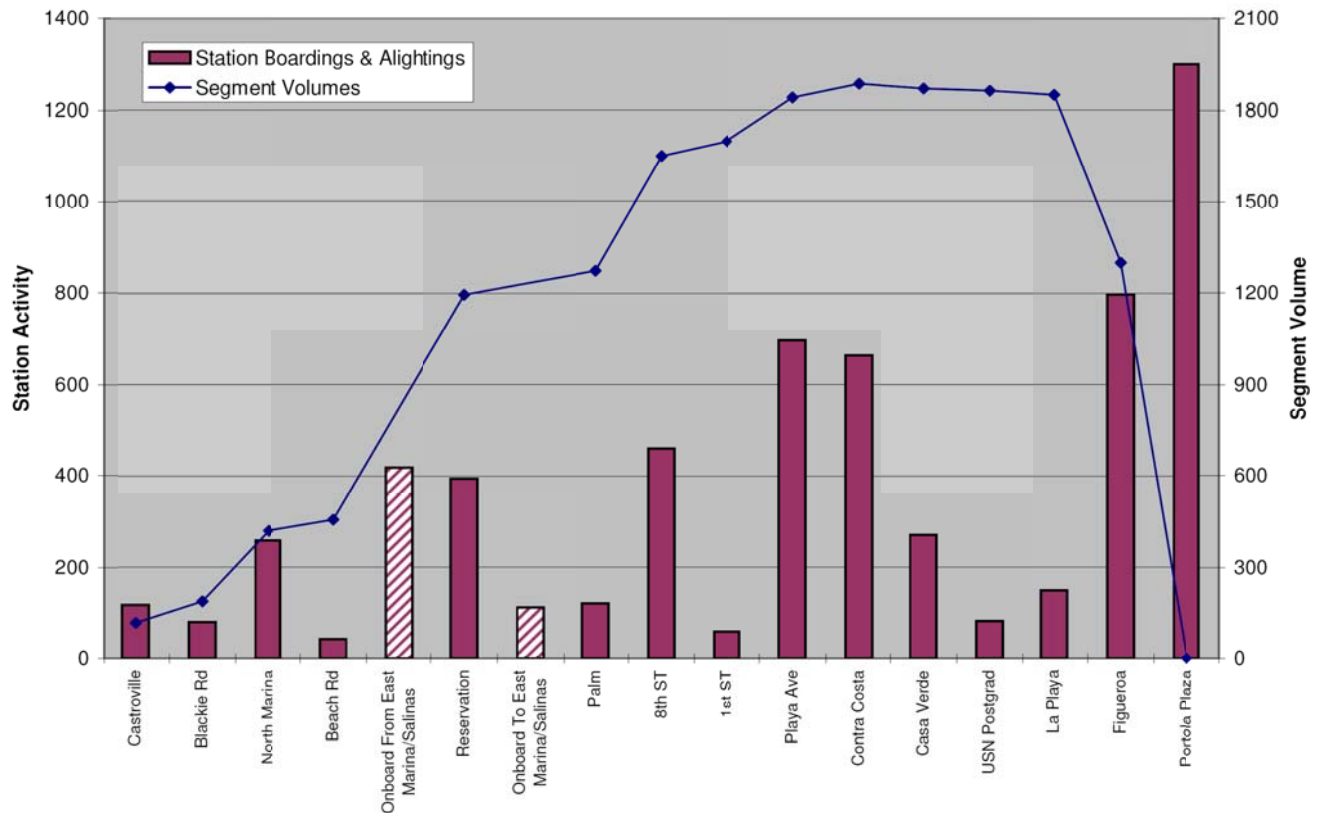
**Table 5-5**  
**Modeled Daily Transit Trips and Boardings by Mode**

	2015 NO-BUILD	2015 ENHANCED BUS	2015 BRT-1	2015 BRT-2	2015 LRT-1	2015 LRT-2
Walk access to local bus	13,693	14,019	11,869	11,863	12,380	12,373
Walk access to BRT/LRT service	N/A	N/A	3,483	3,483	2,663	2,661
Drive access trips	5	230	264	353	299	389
Total transit trips	13,698	14,249	15,616	15,699	15,343	15,422

*Source: Parsons*

Ridership patterns are very similar for each of the four build alternatives. **Figure 5-1** displays the boarding and alighting patterns for one of the build alternatives (BRT-2). Note that the LRT-1 and BRT-1 alternatives would not include the boardings depicted in the figure as captured at the Castroville and Blackie Road stations.

**Figure 5-1: BRT-2 Daily Station Activity and Segment Volumes**



### 5.5 Capital and Operations and Maintenance Costs

Capital and O&M costs were estimated for each of the project alternatives in two iterations:

(1) preliminary estimates were prepared based on the initial definition of features and operating concepts for each alternative, as described in Section 4.2, and (2) these estimates were revised to reflect refinements in the design and operation following review of the alternatives by city officials, MST staff, and Rail Policy Committee members in 2008. The costs summarized below reflect the revised definitions of alternatives.

The most significant revisions in the definition of the alternatives affected the BRT alternatives. These refinements included adjustments to service frequencies, accompanying feeder services, the number of stations, park-and-ride lot sizes and locations. Modifications to the LRT project description were minor and mostly were associated with shortening station platforms. The no-build and enhanced bus alternatives were not modified and remained as identified previously.

The revised definition of the BRT alternatives includes two BRT routes operating on the Monterey Branch Line corridor between Monterey and Marina. In Marina, the two routes would split, with one continuing to Castroville and one continuing to Salinas. In BRT-1, the one continuing to Castroville would operate on surface roads; in BRT-2, it would generally operate within Monterey Branch Line right-of-way. The BRT to Salinas would operate via Reservation and Blanco roads. Both legs would operate with 20-minute headways during peak hours and with 30-minute headways during off-peak hours. This results in combined 10-minute headway during peak periods. Eleven vehicles would be required to operate this

service during peak periods with seven vehicles required during off-peak hours. This revision to the BRT service allows for single-seat rides on BRT vehicles between the Monterey Peninsula and both Salinas and Castroville. BRT services would be complemented by local bus service operating between the Eighth Street Transit Center and the Salinas ITC via Intergarrison and Davis Roads on 30-minute headways.

The alignment of the revised BRT alternatives is shown in **Figures 5-2** and **5-3**. The enhanced bus and LRT alternatives would continue to be as depicted in **Figures 4-2** and **4-5/4-6**, respectively. **Table 5-6** quantifies the cost drivers associated with the change in background bus operations assumed for the BRT alternatives.

**Table 5-6**  
**Bus Rapid Transit Alternative (Revised Definition)**  
**Change in Vehicle Operations and Vehicle Cost Drivers\***

LINE	NAME	ANNUAL Δ MILES	ANNUAL Δ HOURS	Δ MAXIMUM OPERATED VEHICLES
<b>Local Bus Service</b>				
16/17	Edgewater–Marina	58,887	3,630	1
20	Salinas–Monterey	(666,091)	(32,549)	(6)
New	Marina–Salinas	222,030	10,850	2
<b>Bus Rapid Transit Service</b>				
BRT-1 and BRT-2	Monterey–Castroville/Marina–Salinas	1,330,600	63,250	11

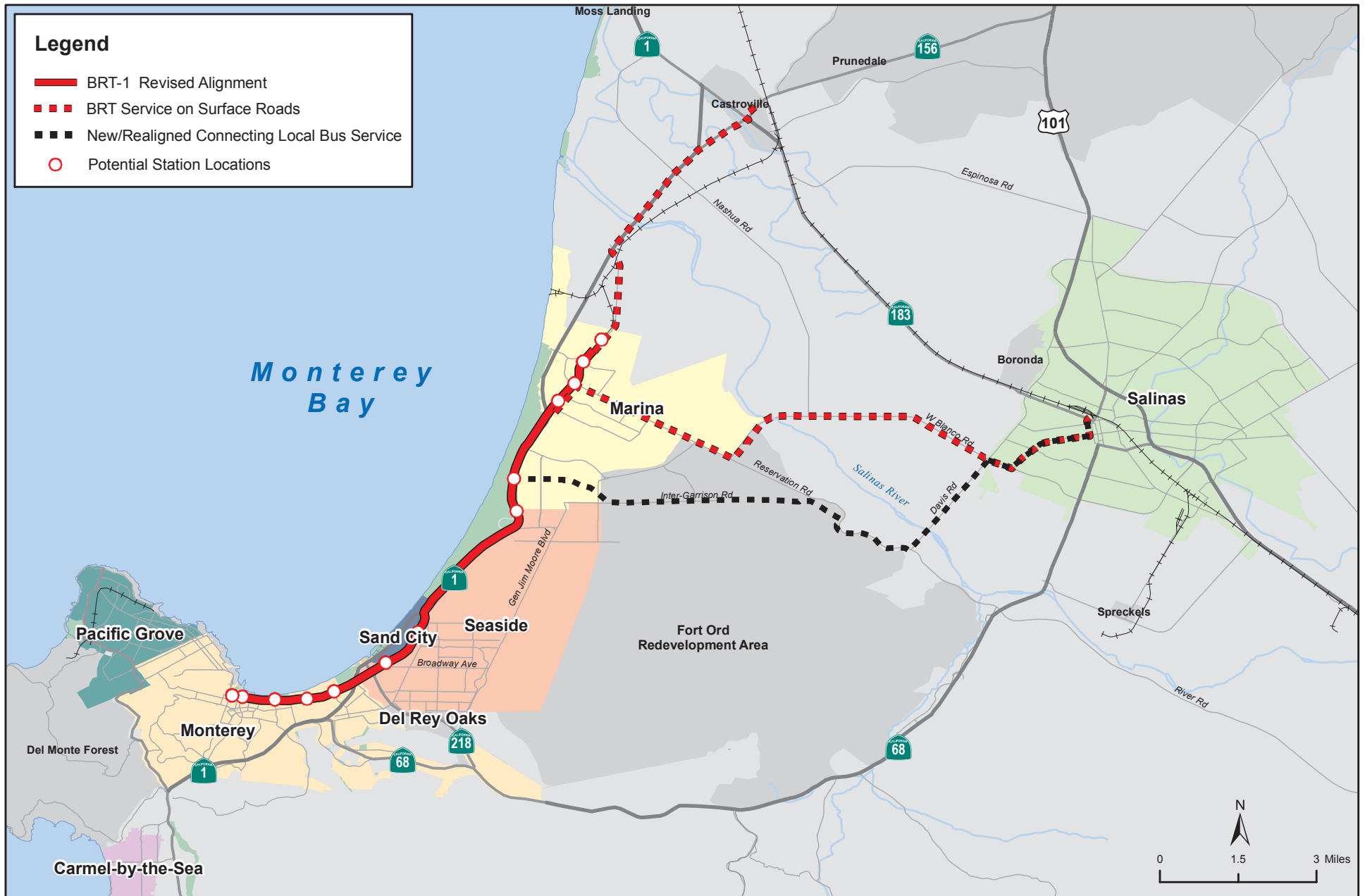
\*Change from no-build alternative  
Source: Parsons

### 5.5.1 Capital Costs

Below is a brief description of the alternatives, followed by tables indicating their capital costs.

The **enhanced bus alternative** expands an existing bus service route operating within local roadways and modifies the existing bus stops and transit centers to provide for better operation and amenities. **BRT transit guideway alternatives** assume a two-way guideway between SR-183 in Castroville and La Playa Street in Monterey, and single-lane guideway with passing areas between the Castroville commuter rail station and SR-183 and between La Playa Street and downtown Monterey. **Light rail transit alternatives** assume construction of a single track with passing sidings. The rail system would be unsignalized, except for specific turnouts. A maintenance and storage facility for the rail alternatives is assumed near the Fort Ord quartermaster area, east of SR-1. Where the project crosses the Salinas River via fixed-guideway in LRT-2 plans, a new bridge is proposed.

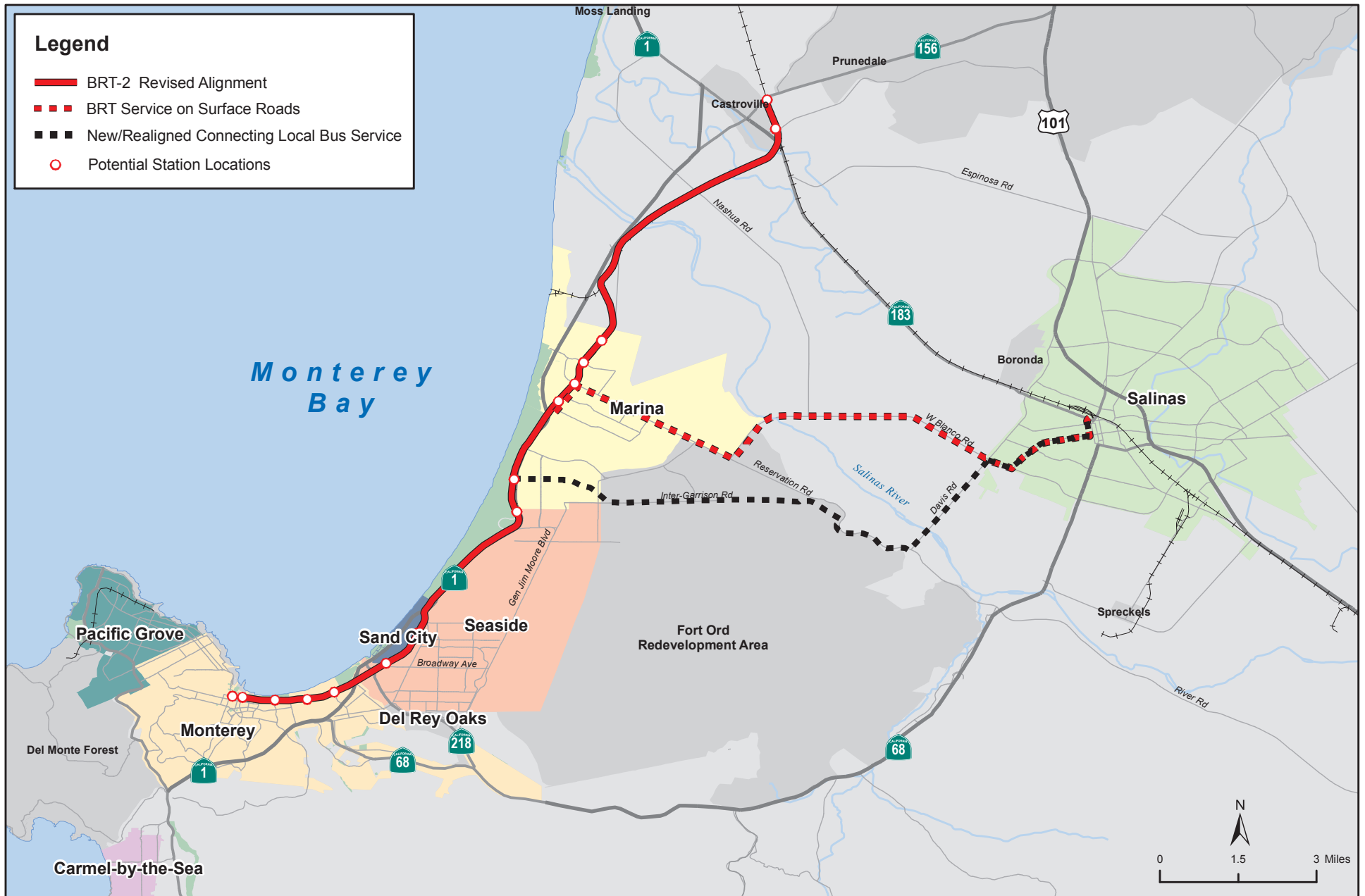
Capital costs for each alternative, itemized by cost category, are summarized in **Table 5-7**. See Alternatives Analysis Volume 1, Chapter 5 for a more comprehensive discussion of the capital costs associated with the build BRT and LRT alternatives.



Kimley-Horn  
and Associates, Inc.

FIGURE 5-2  
BRT-1 REVISED ALIGNMENT





Kimley-Horn  
and Associates, Inc.

FIGURE 5-3  
BRT-2 REVISED ALIGNMENT

**Table 5-7**  
**Capital Costs by Category (2007 \$ in millions)**

ALTERNATIVE	COST CATEGORY									TOTAL
	GUIDEWAY/ TRACK	CIVIL	GRADE CROSSINGS	STRUCTURAL	STATIONS	SYSTEMS	VEHICLES	ROW	ADD-ON COSTS*	
BRT-1	\$23.64	\$3.84	\$ 8.75	\$0.05	\$23.24	\$0.11	\$14.00	\$4.81	\$ 83.57	\$162.02
BRT-2	\$34.62	\$4.82	\$ 9.85	\$1.31	\$23.66	\$0.12	\$14.00	\$4.81	\$102.04	\$195.23
LRT-1	\$13.83	\$1.68	\$ 9.91	\$0.15	\$20.82	\$3.20	\$32.80	\$4.81	\$ 81.10	\$168.31
LRT-2	\$20.90	\$1.72	\$11.26	\$6.73	\$21.69	\$3.22	\$36.90	\$4.81	\$103.58	\$210.80
Enhanced Bus	\$ 0.00	\$0.00	\$ 0.63	\$0.00	\$14.68	\$0.00	\$ 6.60	\$0.00	\$ 23.69	\$ 45.60

\* Add-on costs = design contingencies, construction mobilization, construction contingencies, project implementation, project reserve, escalation  
Source: Parsons

**Table 5-8** provides estimates of annualized capital costs for the enhanced bus and BRT and LRT build alternatives. These costs are based on a 7 percent discount rate and FTA assumptions regarding the number of useful years of each component.

When viewed on an annualized cost basis, there is virtually no difference in cost between the BRT and LRT modes, based on the definition of the alternatives. The shorter segment options between downtown Monterey and north Marina (BRT-1 and LRT-1) are clearly less expensive.

**Table 5-8**  
**Annualized Cost (2007 \$ in millions)**

COST COMPONENT	ENHANCED BUS	BRT-1	BRT-2	LRT-1	LRT-2
Guideway and track elements	n/a	4.48	6.56	2.57	3.88
Stations and stops	2.44	3.86	3.93	3.54	3.68
Civil Work	n/a	0.63	0.79	0.28	0.29
Structures	n/a	0.01	0.22	0.03	1.14
Grade crossings	0.14	1.94	2.19	2.25	2.56
Systems	n/a	0.02	0.02	0.62	0.62
<b>Construction Subtotal</b>	<b>2.58</b>	<b>\$10.94</b>	<b>\$13.71</b>	<b>\$9.29</b>	<b>\$12.17</b>
ROW, land, existing improvements	n/a	0.34	0.34	0.34	0.34
Vehicles	1.15	2.43	2.43	3.88	3.88
<b>Total</b>	<b>\$3.73</b>	<b>\$13.70</b>	<b>\$16.47</b>	<b>\$13.50</b>	<b>\$16.39</b>

Source: Parsons

Total costs for all build alternatives meet FTA’s Small Starts parameters discussed previously in this report. They are within the total project budget that was deemed appropriate at the outset of the study.

### 5.5.2 Operating and Maintenance Costs

#### 5.5.2.1 Enhanced Bus Alternative

For cost estimating purposes, the reduction in stop frequency and the inclusion of traffic signal priority on Line 20 is assumed to offset reductions in speed associated with projected increased background traffic congestion along the route. The change in annual revenue vehicle hours and miles, compared to no-build bus data, are indicated in **Table 5-9**. This table includes all bus service modifications included as part of this alternative, including Routes 16, 17 and 20.

Utilization of low floor, articulated, higher capacity buses on Line 20 will result in higher vehicle operations and maintenance expense, over and above the operations and maintenance cost impacts associated with the operation of increased frequency of service. Upgrading the station/stops on Line 20 through the addition of high quality shelters, dynamic message displays, and increased security features would also add to non-vehicle maintenance expenses, as would the maintenance of traffic signal prioritization.

#### 5.5.2.2 BRT Alternatives

**Table 5-10** quantifies the change in operations and maintenance expense associated with the two alternatives of BRT service. Utilization of low floor, articulated, higher capacity, advanced design vehicles for the BRT service will result in higher vehicle operations and maintenance expense, over and above the operations and maintenance cost impacts associated with the operation of increased frequency of service. Maintaining the guideway, grade crossing protection, signals and communication systems and the bus rapid transit stations will additionally add to operations and maintenance expenses, compared with local bus operations. Accompanying modifications to local bus service are included.

**Table 5-9**  
**Enhanced Bus Alternative Change in Operations and Maintenance Costs (FY 2007 \$)**

COST FUNCTION	BASIS	SERVICE	CHANGE FROM NO-BUILD	UNIT COST	WEIGHTED COST FACTOR	ANNUAL COST
Vehicle Operations	Hours	Local	(28,919)	\$56.23	1.0	(\$1,626,115)
	Hours	Enhanced	54,248	\$56.23	1.0	3,050,365
	Miles	Local	(607,204)	\$ 0.75	1.0	(455,403)
	Miles	Enhanced	1,045,624	\$ 0.75	1.5	1,176,327
Vehicle Maintenance	Miles	Local	(607,204)	\$ 1.07	1.0	(649,708)
	Miles	Enhanced	1,045,624	\$ 1.07	1.67	1,868,425
Facilities Maintenance	MOV	Local	(5)	\$13,752	1.0	(82,512)
S&C	Route miles*	Enhanced	18 × 0.30	\$89,325	0.5	241,178
Stations	Stations	Enhanced	21 × 0.40	\$89,325	0.5	375,165
Stores	Fleet vehicles	Enhanced	12 × 0.065	\$89,325	1.0	69,674
General Administration	MOV	Local	(5)	\$54,303	1.0	(271,515)
	MOV	Enhanced	10	\$54,303	1.0	543,030
					<b>TOTAL</b>	<b>\$4,238,911</b>

\*Route miles under traffic signal control  
Source: Parsons

**Table 5-10**  
**Bus Rapid Transit Alternative (Revised Definition) Change in Operations and Maintenance Cost (FY 2007 \$)**

COST FUNCTION	BASIS	SERVICE	CHANGE FROM NO-BUILD	UNIT COST	WEIGHTED COST FACTOR	BRT-1 ANNUAL COST	BRT-2 ANNUAL COST
Vehicle Operations	Hours	Local	(18,069)	\$56.23	1.0	(1,016,020)	(1,016,020)
	Hours	BRT	63,250	\$56.23	1.0	3,556,548	3,556,548
	Miles	Local	(385,174)	\$ 0.75	1.0	(288,881)	(288,881)
	Miles	BRT	1,330,600	\$ 0.75	1.0	997,950	997,950
Vehicle Maintenance	Miles	Local	(385,174)	\$ 1.07	1.0	(412,136)	(412,136)
	Miles	BRT	1,330,600	\$ 1.07	2.0	2,847,484	2,847,484
Facilities Maintenance	MOV	Local	(3)	\$13,752	1.0	(40,716)	(40,716)
S&C	Route miles	BRT-1	10 × 0.30	\$89,325	1.0	267,975	
	Route miles	BRT-2	16 × 0.30	\$89,325	1.0		428,760
MOW	Guideway miles	BRT-1	10× 0.315	\$89,325	1.0	281,374	
	Guideway miles	BRT-2	16× 0.315	\$89,325	1.0		450,198
Stations	Stations	BRT	23 × 0.40	\$89,325	1.0	821,790	821,790
TVM	Units	BRT	43 × 0.095	\$89,325	1.0	364,893	364,893
Stores	Fleet vehicles	BRT	14 × 0.065	\$89,325	1.0	81,286	81,286
General Administration	MOV	Local	(3)	\$54,303	1.0	(162,909)	(162,909)
	MOV	BRT	11	\$54,303	1.0	597,333	597,333
<b>TOTALS</b>						<b>\$7,895,971</b>	<b>\$8,225,580</b>

Source: Parsons

5.5.2.3 LRT Alternatives

**Table 5-11** quantifies the change in operations and maintenance expense associated with the two alternatives for LRT service. Use of diesel electric single car train consists are assumed. Accompanying modifications to local bus service are included.

**Table 5-11**  
**Light Rail Transit Alternative Change in Operations and Maintenance Costs (FY 2007 \$)**

COST FUNCTION	BASIS	SERVICE	CHANGE FROM NO-BUILD	UNIT COST	WEIGHTED COST FACTOR	LRT-1 ANNUAL COST	LRT-2 ANNUAL COST
Vehicle Operations	Hours	Local	(1,795)	\$56.23	1.0	(100,933)	(100,933)
	Hours	LRT-1	34,500	\$56.23	1.0	1,939,935	—
	Hours	LRT-2	46,000	\$56.23	1.0	—	2,586,580
	Miles	Local	(52,128)	\$ 0.75	1.0	(39,096)	(39,096)
	Miles	LRT-1	575,000	\$ 0.75	2.0	862,500	—
	Miles	LRT-2	920,000	\$ 0.75	2.0	—	1,380,000
Vehicle Maintenance	Miles	Local	(52,128)	\$ 1.07	1.0	(55,777)	(55,777)
	Miles	LRT-1	575,000	\$ 1.07	3.0	1,845,750	—
	Miles	LRT-2	920,000	\$ 1.07	3.0	—	2,953,200
Facilities Maintenance	MOV	Local	0	\$13,752	1.0	—	—
S&C	Route miles	LRT-1	10 × 0.30	\$89,325	1.0	267,975	—
	Route miles	LRT-2	16 × 0.30	\$89,325	1.0	—	428,765
MOW	Guideway miles	LRT-1	10 × 0.315	\$89,325	1.0	281,377	—
	Guideway miles	LRT-2	16 × 0.315	\$89,325	1.0	—	450,203
Yard	Facilities	LRT-1	1	\$89,325	1.0	89,325	—
	Facilities	LRT-2	1	\$89,325	1.0	—	89,325
Station	Stations	LRT-1	14 × 0.40	\$89,325	1.0	500,226	—
	Stations	LRT-2	16 × 0.40	\$89,325	1.0	—	571,687
TVM	Units	LRT-1	18 × 0.095	\$89,325	1.0	152,748	—
	Units	LRT-2	20 × 0.095	\$89,325	1.0	—	169,720
Stores	Fleet vehicles	LRT-1	8 × 0.065	\$89,325	1.0	46,450	—
	Fleet vehicles	LRT-2	10 × 0.065	\$89,325	1.0	—	58,062
General Administration	MOV	Local	0	\$54,303	1.0	—	—
	MOV	LRT-1	6	\$54,303	1.0	271,515	—
	MOV	LRT-2	8	\$54,303	1.0	—	434,424
<b>TOTALS</b>						<b>\$6,061,995</b>	<b>\$8,926,160</b>

Source: Parsons



Table 5-12 below summarizes the net change in operating costs associated with each of the alternatives.

**Table 5-12**  
**Net Change in Operating Costs by Alternative**  
*(FY 2007 \$ in millions)*

ALTERNATIVE	ANNUAL COST
BRT-1	\$7.896
BRT-2	\$8.226
LRT-1	\$6.062
LRT-2	\$8.926
Enhanced Bus	\$4.239

Source: Parsons

### 5.5.3 Summary of Revised Alternatives

Operating and capital costs are identified for each refined alternative in Table 5-13.

**Table 5-13**  
**Summary of Capital, Operations and Maintenance Cost Estimates**  
*(FY 2007 \$ in millions)*

ALTERNATIVES	CAPITAL COSTS	SYSTEM O&M COSTS	INCREMENTAL O&M COSTS
No-build	N/A	\$23.68	\$0
Enhanced bus	\$46	\$27.92	\$4.239
BRT-1	\$162	\$31.58	\$7.896
BRT-2	\$195	\$31.91	\$8.226
LRT-1	\$168	\$29.75	\$6.062
LRT-2	\$211	\$32.61	\$8.926

Source: Parsons

The capital expense and ongoing operations and maintenance costs are nearly identical for comparable rail and bus guideway alternatives.

The estimated increase in net public operating costs for the enhanced bus and build alternatives are summarized in Table 5-14. The net cost credits estimate fare revenue associated with an alternative.

**Table 5-14**  
**Net Public Cost Increment (2007 \$ in millions)**

PARAMETER	ENHANCED BUS	BRT-1	BRT-2	LRT-1	LRT-2
Annual operating and maintenance cost	(\$27.92)	(\$31.58)	(\$31.91)	(\$29.75)	(\$32.61)
Annual passenger revenue	\$ 7.31	\$ 8.01	\$ 8.05	\$ 7.87	\$ 7.91
Net public increment	(\$20.61)	(\$23.57)	(\$23.87)	(\$21.88)	(\$24.70)
<b>Net public increment over No-Build</b>	<b>(\$3.95)</b>	<b>(\$6.91)</b>	<b>(\$7.21)</b>	<b>(\$5.22)</b>	<b>(\$8.04)</b>

Source: Parsons

**5.5.4 Cost-Effectiveness**

The cost-effectiveness of each of the alternatives with the revised project definition is compared in **Table 5-15**.

**Table 5-15**  
**Cost-Effectiveness Comparison (2007 \$)**

ALTERNATIVES	CAPITAL COST PER USER <sup>1</sup>	CAPITAL COST PER NEW TRANSIT RIDER <sup>2</sup>	OPERATING COST PER USER <sup>3</sup>	NET PUBLIC INCREMENT PER NEW TRANSIT USER <sup>4</sup>
Enhanced bus	\$3.67	\$20.99	\$4.17	\$22.23
BRT-1	\$9.91	\$22.15	\$5.71	\$11.17
BRT-2	\$11.65	\$25.52	\$5.82	\$11.17
LRT-1	\$9.42	\$25.45	\$4.23	\$9.84
LRT-2	\$11.48	\$29.48	\$6.25	\$14.46

<sup>1</sup> Capital cost per user = annualized capital cost / no. of annual boardings on alternative

<sup>2</sup> Capital cost per new transit rider = annualized capital cost / increase in annual system-wide transit trips with this alternative

<sup>3</sup> Operating cost per user = net operating cost of alternative / no. of annual boardings on alternative

<sup>4</sup> Net public increment per new transit user = net annual public increment cost/ increase in annual systemwide transit trips with this alternative

**5.6 Financial Plan**

**5.6.1 Capital Costs**

As currently planned, sufficient funding for the proposed Monterey Peninsula Fixed-Guideway project is expected and will be obtained from a mix of revenue sources, including:

- State of California, Proposition 116 rail bond funds
- State Transportation Improvement Program (STIP)–Public Transportation Account funds
- Local transportation impact fees
- Contributions from local partner agencies
- TAMC land lease revenues
- State and local sales tax revenues
- Federal grant funding.

Insofar as capital costs, a proposed application for a Federal Transit Administration Small Starts funding grant in the amount of \$75 million is intended to fill the gap between the available state and local funding and the estimated total project cost.

**Table 5-16** outlines a potential financing plan for capital cost elements which appears viable absent the passage of a future local sales tax measure, such as the failed Measure Z. The Capital Cost Financial Plan proposed for the Monterey Peninsula Fixed-Guideway project would be sufficient to address the enhanced bus, BRT-1, and LRT-1 alternatives. The BRT-2 and LRT-2 alternatives require significantly higher funding, most of which would come from currently unsecured STIP funding. Note that the costs provided in Table 5-16 reflect anticipated year-of-expenditure costs, as estimated in 2008, while the

**Table 5-16**  
**Monterey Peninsula Fixed-Guideway Capital Cost Financial Plan (YOE \$)**

	ALTERNATIVE				
	BRT-1	BRT-2	LRT-1	LRT-2	Enhanced Bus
<b>Cost Items</b>					
1. Net project capital cost <sup>1</sup>	<b>\$187,561,640</b>	<b>\$231,016,450</b>	<b>\$193,880,550</b>	<b>\$249,544,760</b>	<b>\$59,609,710</b>
<b>Revenue Sources</b>					
2. FTA Section 5309 Small Starts	<b>\$75,000,000</b>	<b>\$ 75,000,000</b>	<b>\$75,000,000</b>	<b>\$ 75,000,000</b>	—
3. Local and State funding	<b>\$112,561,640</b>	<b>\$156,016,450</b>	<b>\$118,880,550</b>	<b>\$174,544,760</b>	<b>\$68,848,185</b>
a. State Proposition 116	14,141,525	14,141,525	14,141,525	14,141,525	(9,238,475)
b. Regional Transportation Impact Fee <sup>2</sup>	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
c. FORA FY 2008–2022 CIP (Transit Element) <sup>3</sup>					
Eighth Street Transit Center (FTA match)	2,360,000	2,360,000	2,360,000	2,360,000	2,360,000
Transit vehicle purchase (partial FTA match)	7,175,054	7,175,054	7,175,054	7,175,054	4,763,769
d. FORA Development Fee <sup>4</sup>	21,089,075	21,089,075	21,089,075	21,089,075	—
e. STIP (secured) <sup>5</sup>	10,256,000	10,256,000	10,256,000	10,256,000	3,000,000
STIP (unsecured)	\$56,539,986	\$99,994,796	\$62,858,896	\$118,523,106	\$66,962,891

Notes:

<sup>1</sup> Includes \$9,238,475 expended for Branch Line right-of-way purchase in 2003. Eligible for Federal matching funds. For Enhanced Bus, repayment of right-of-way purchase grant is assumed. Dollars are expressed in year-of-expenditure amounts, while all previous tables in this chapter are in 2007 dollars. Therefore, project cost amounts listed in this table will not match previous tables.

<sup>2</sup> TAMC assessed Regional Impact Fees

<sup>3</sup> Fort Ord Reuse Authority Capital Improvement Program, fiscal year 2008/2009 through 2021/2022, approved June 13, 2008, Table 2, page 11 and Table 5, page 22. For Enhanced Bus, 50 percent of vehicle cost is assumed.

<sup>4</sup> Fort Ord Reuse Authority Notice of Development Fee as of July 1, 2008. Development Fee Credit for Dedicated Public Facilities eligible for funding by the FORA Development Fee. Proposed swap of Monterey Branch Line fixed-guideway project for Regional Highway project R3–Highway 1–Seaside/Sand City, and Highway 1/Monterey Road Interchange

<sup>5</sup> Future State Transportation Improvement Program allocation (secured and unsecured).

Source: Parsons

preceding capital cost tables (Tables 5-7, 5-9, and 5-13) reflected base year 2007 costs. Year-of-expenditure costs are significantly higher due to projected inflation between 2007 and year-of-expenditure.

### **5.6.2 Operating Costs**

It is expected that TAMC will authorize the local transit service provider, MST, with the operational responsibility for the fixed-guideway service. It is also expected that funding sources for non-capital costs will be formally agreed upon and that the proportional breakdown will be similar to the current MST revenue and cost summary structure.

It is anticipated that net public operating costs (transit operations and maintenance expense subsidization) will be met by four major funding sources, including Local Transportation Funds, State Transit Assistance funds for the three initial years of service, TAMC TOD land lease revenues, and local sales tax revenues.

See Alternatives Analysis Volume 1, Chapter 8, for detailed discussion of each of the potential funding sources.

## **5.7 Selection of LPA**

### **5.7.1 Public Evaluations**

Numerous public meetings, stakeholder workshops, and media outreach events were held during the course of the Monterey Peninsula Fixed-Guideway project development process. Input was solicited from a wide variety of sources regarding facility design, station locations, service characteristics, potential funding, and environmental impact mitigation. This public involvement focused on the type and quality of the services to be provided and on bus and rail fixed-guideway alternative facilities (stations, park-and-ride, layover bases, etc.) within the context of the Monterey Peninsula Fixed-Guideway Study. Extensive public input over the course of over four years was received regarding the alignment and modes. Public and stakeholder input to the Monterey Peninsula Fixed-Guideway Study received is summarized below:

- Monterey Peninsula communities support local service along the Monterey Peninsula, connecting to commuter rail service at Castroville.
- Public agencies internal to Monterey County support the Monterey Peninsula Fixed-Guideway proposed projects. These include TAMC, MST, the Monterey County Resource Management Agency, and the Peninsula Cities.
- No significant public opposition to the shortlisted Monterey Peninsula Fixed-Guideway alternatives has arisen in four years of project development, informational meetings, or circulation of individual project reports.

Insofar as mode selection, the public participation outreach effort surfaced proponents for both the BRT and LRT options with no real consensus of public opinion favoring one mode or the other. Proponents of the BRT options cited operational flexibility as the key differentiator favoring this mode choice. Proponents of LRT options cited the superior image/cache of LRT over bus-based options as being essential for attracting choice riders to transit.

### ***5.7.2 Adoption of Locally-Preferred Alternative***

The culmination of this corridor-level analysis was selection of the light rail transit alternative as the locally-preferred alternative by TAMC Board of Directors in Resolution No. 2009-13, adopted on October 28, 2009.

The locally-preferred alternative consists of light rail transit service along the Monterey Branch Line and will be established in two phases, depending on funding availability. Phase 1 provides service between downtown Monterey and Marina with connecting bus service between Marina and Salinas. Phase 2 would extend light rail service between northern Marina and Castroville. Due to recent budgetary and funding constraints, a reduced cost version of Phase 1 was developed and is considered the minimal operable segment for the purposes of this project. The minimal operable segment does not significantly modify the alignment, stations or corresponding bus service.

### ***5.7.3 Criteria Used in Selection of Locally-Preferred Alternative***

- The decision to adopt a two-phase light rail transit project was based on the proposed project's ability to provide superior transportation service in the long-term—resulting in fewer single occupant vehicles on roadways, reduced greenhouse gases, and promoting transit-related development—while best meeting the vision and future plans for each of the affected cities. Specific justification cited by TAMC Board of Directors in that adoption included:
  - Light rail transit was deemed a superior long-term investment strategy.
  - By preserving the tracks on this corridor intercity rail may one day run from San Francisco to Monterey, providing a fast and efficient way of traveling to and from San Francisco.
  - Light rail vehicles also hold more riders than bus rapid transit vehicles and have the ability to add train cars, which will be beneficial when ridership increases in the future. This ability to add train cars is key for the capacity of the line since the corridor is single lane/track through Window on the Bay in Monterey.
  - Light rail will be better for persons with disabilities with easy on and off boarding for those in wheelchairs, without requiring any driver assistance. Trains will also remain on schedule since assistance is not needed by the vehicle driver to board and alight.
  - Light rail vehicles are much more conducive to use by bicyclists as compared to buses. Each vehicle has a higher capacity for bicycles and on/off movements are easier on light rail than bus.
  - Public input: the choice rider is more supportive of a light-rail alternative.
  - The marginally higher operating cost associated with full LRT implementation is anticipated to be offset through a greater capture of choice riders and higher ridership with a LRT system than a BRT system.



## 6.0 Locally Preferred Alternative

The locally-preferred alternative will provide light rail transit service located predominately within the existing Monterey Branch Line right-of-way. Transit service will be implemented in two phases. In the first phase, railroad track will be restored or constructed for a distance of about 10 miles between downtown Monterey and north Marina, with bus service continuing to Castroville on local roadways. Phase 1 service is anticipated to be operational by 2015. The second phase will extend light rail transit service an additional 5.2 miles to the Castroville rail station north of Blackie Road. Standard bus service will connect with light rail transit stations, including between Marina and the intercity rail station at Salinas. Phase 2 is dependent on funding and ridership demand, but could be realized by 2030.

The locally-preferred alternative is generally consistent with the project definition for LRT-1 in the initial phase, and LRT-2 in the ultimate, build-out phase. Minor variations in the project definition are incorporated based on further conceptual engineering and cost estimating that have been performed on the corridor following the initial preparation of the Alternatives Analysis evaluation described earlier in this report. The locally-preferred alternative project description is described in this chapter, including the minor modifications to the project description, as well as updated project cost estimates and ridership forecasts.

The project alignment is shown in **Figure 6-1**.

### 6.1 Locally-Preferred Alternative Project Definition

The locally-preferred alternative adopted by the TAMC Board of Directors predominately incorporates the project elements that characterized alternatives LRT-1 and LRT-2 described in Chapters 4 and 5. However, the locally-preferred alternative incorporates a project definition that has been modified from those alternatives, based on the furthering of conceptual engineering and cost estimating and additional public input received after the completion of the alternatives evaluation. The ridership forecasts and cost estimates contained in this chapter are based on the locally-preferred alternative definition, and therefore differ from the data provided in Chapters 4 and 5.

#### 6.1.1 Evolution of the Locally-Preferred Alternative

Subsequent to the adoption of the locally-preferred alternative in fall 2009, additional analysis was performed and the project description was further defined. Project cost estimates were further developed, ridership models were refined, a visual simulation was prepared, and an extensive public outreach process was undertaken. A total of 27 different public outreach events were conducted between April 2010 and January 2011 to obtain public feedback on the locally-preferred alternative project components. Meetings were conducted in each of the cities and communities along the proposed route, and at an AMBAG board meeting. At the conclusion of the intensive outreach effort, a revised project definition and project cost estimate were presented at the May 2011 Rail Policy Committee meeting.

The differences between the locally-preferred alternative and the previously analyzed LRT-1 and LRT-2 are summarized below:



- The number of stations was reduced through station consolidation, also somewhat reducing the total alignment length.
  - ♦ Due to their close proximity to each other and the request of nearby land owners, the El Estero Park and Naval Postgraduate School stations have been consolidated and relocated to Sloat Avenue.
  - ♦ Also due to close proximity, the Portola Plaza and Figueroa stations have been consolidated at Custom House Plaza, slightly shifting the project's western terminus to the east.
- The Castroville station was eliminated due to the relocation of the proposed commuter rail station to Blackie Road. The Castroville station was previously the northern terminus of the alignment. Thus the northern Phase 2 terminus shifts to Blackie Road, reducing the ultimate alignment by approximately 0.8 miles. The Blackie Road station will serve the Castroville community. The First Street station was shifted into the second phase. The area around the First Street station is currently underdeveloped. When planned development occurs, the station will be added.
- Some adjustments were made to local bus route modifications planned to accompany the project, identified below:
  - ♦ The Route 20 alignment was modified from previously described to extend between Castroville, Marina and Salinas, as described in further detail in Section 6.2. This provides enhanced service between the Phase 1 end of line in Marina and the planned commuter rail station in Castroville.
  - ♦ The Intergarrison Road bus service between the Eighth Street/Cal State Monterey Bay Transit Center and Salinas is still planned, but will be undertaken as a separate effort with other funding sources and is no longer part of the project definition.
- Headway along the project alignment was reduced from 12 minutes to 15 minutes as a cost-saving measure and to better align with projected demand.
- Two options are under consideration for the placement of the maintenance facility, both located on TAMC/MST-owned land in the Fort Ord redevelopment area. One of these locations is the maintenance facility location assumed in the LRT-1 and LRT-2 alternatives definition.
- The no-build/background transit definition was modified to remove any improvements from existing conditions in light of recent financial and ridership trends. Thus, service and operating cost comparisons between the project alternative, enhanced bus and no-build scenarios have been revised.
- The transit vehicles previously assumed are no longer in production. A new vehicle type, which is longer and costlier than previously assumed, was incorporated into the cost estimate.

It should be noted that in addition to items identified above, the initial phase does not include certain cost elements contained in the light rail transit (LRT-1 and LRT-2) cost estimates of Chapter 5 and Alternatives Analysis Volume 1. These separate price items were removed from the cost estimate to more accurately reflect those agencies which are appropriately responsible for those costs. The changes include:

- Attributing the cost of the MST Transfer Center and park-and-ride lot at Eighth Street to the Fort Ord Reuse Authority traffic impact mitigation program, as the transit center and park-and-ride lot

project is specified in the Fort Ord Reuse Authority's traffic impact fee program, and will be constructed with or without the Monterey Branch Line fixed-guideway project.

- Attributing the cost of local street improvements at the SR-1/Fremont Boulevard Interchange to the SR-1 Improvement Program, as specified in the Caltrans Project Study Report (Project Development Support) project initiation document, the Fort Ord Reuse Authority transportation impact mitigation program, and TAMC's regional transportation impact fee program, as these local street improvements are required to address existing traffic deficiencies and will be constructed with or without the Monterey Branch Line fixed-guideway project.
- Deferring the acquisition of right-of-way and construction of the park-and-ride lot at Casa Verde Way as this park-and-ride lot was not assumed as included in the project for ridership forecasting and therefore does not contribute to the ridership of the Phase 1 project.

For a full description of the locally-preferred alternative alignment, refer to Alternatives Analysis Volume 2, Chapter 2.

For a comparison of the locally-preferred alternative against the alternatives described and analyzed in Chapters 4 and 5, see Section 6.7.

## **6.2 Operations**

Light rail transit service will operate between Monterey and Marina initially, with enhanced connecting bus service to Castroville and Salinas. Initially, light rail transit service will operate with headways of 15 minutes during peak periods, 30 minutes during the midday, and 60 minutes during the evening. Sunday service will operate with 30 minute headways during the daytime. Service will be offered from 5:00 a.m. to midnight. A total of 94 trains (47 round trips) are assumed to run on weekdays and Saturdays, 310 days per year. A total of 48 trains (24 round trips) are assumed to run on Sundays and holidays, 55 days per year. Headways will be decreased to 10 or 12 minutes during later years of operation, as demand warrants.

The light rail service will take approximately 10 minutes to travel the 3.5 miles from Downtown Monterey to Playa Avenue in Sand City. It will take approximately 25 minutes to travel the entire 10 mile length of the corridor. This compares very favorably with the 33 minutes that it currently takes to travel the 8 miles from Downtown Monterey to the Marina Transit Exchange via local bus service.

Intercity service will be initially provided via a bus connection between Marina and Castroville, with transfers to commuter rail service at the Castroville Station. This bus connection will be achieved by modifying existing Route 20 to serve between Castroville, Marina and Salinas, as opposed to the existing alignment between Monterey, Marina and Salinas. Route 20 will interface with the LRT service at the Downtown Marina Station. In addition, Route 27, which provides service between Marina and Watsonville via Castroville, would remain, supplementing the local bus connection between LRT and the planned commuter rail station in Castroville. A direct connection between the light rail system and the commuter rail service at Castroville will be achieved in the second phase of project implementation.

Local bus service is also planned, although as a separate project, from Salinas to downtown Marina and to the California State University at Monterey Bay. This service is planned to operate with BRT-like

features, including special branding and some utilization of bus-only lanes. The bus service will interface with the LRT service at the Eighth Street station.

The service is planned to have a similar passenger fare as MST regional routes. As of Fiscal Year 2009, the average fare per boarding on MST routes was \$1.58.

**Table 6-1** quantifies the service effects associated with the locally-preferred light rail transit alternative initial segment, which includes light rail service between north Marina and downtown Monterey, with connecting local bus service to Salinas and Castroville. The table indicates that Line 20 mileage, hours, and vehicle requirements will be reduced as the route is shortened to run between Salinas and Reindollar Avenue in Marina, rather than continuing south to downtown Monterey. Offsetting this service will be the institution of a new bus route between Castroville and Marina, which connects to the light rail transit service.

**Table 6-1**  
**Locally Preferred Alternative Change in**  
**Vehicle Operations and Vehicle Cost Drivers\***

LINE	NAME	ANNUAL Δ MILES	ANNUAL Δ HOURS	Δ MAXIMUM OPERATED VEHICLES
<b>Local Bus Service</b>				
20	Castroville–Marina	134,400	5,000	1
20	Marina–Monterey	(183,507)	(10,850)	(3)
<b>Light Rail Transit Service</b>				
Minimum operable segment	Monterey–Marina	317,800	15,890	4

\*Change in hours, miles, or vehicles from background bus (no-build) alternative  
 Source: Parsons

TAMC will purchase, and MST will operate, hybrid diesel electric or diesel multiple unit, Federal Railroad Administration-noncompliant light rail vehicles, such as those utilized along the Oceanside, California Sprinter light rail line or the Capital MetroRail Red Line in Austin, Texas. All train equipment will be interchangeable, thereby minimizing requirements for spare vehicles. The fleet will be stored at the former Fort Ord military reservation on lands owned by TAMC and/or MST.

The Phase 1 light rail service is designed to run without train signals. Trains will be diverted to passing sidings with spring switches. Some signals will be needed at track junctions and crossings and will consist of wayside signal masts at specific locations. Signals will display the orientation of the switch points as set by the operator at motorized turnouts using wayside push buttons. Automatic block signaling is an optional item.

## 6.3 Facilities

### 6.3.1 Stations

The initial phase of the project consists of 10 stations between Monterey and Marina. Five stations will serve Marina at Marina Green Drive, Beach Road, Reservation Road, Palm Avenue, and Eighth Street.



Two stations will serve Seaside and Sand City at Playa Avenue and Contra Costa Street. Monterey will be served by three stations at Casa Verde Way, Naval Postgraduate School (Sloat Avenue), and Custom House Plaza. The second phase includes two additional stations, one at First Street in Seaside, and the second at Blackie Road in Castroville. The Phase 2 Blackie Road station will be incorporate into to the planned commuter rail station. However, modifications to the planned commuter rail station will be required to accommodate a separate station track and platform for non-Federal Railroad Administration-compliant vehicles.

Station names were revised based on public input, and in some cases a shift in location. **Table 6-2** below indicates the original name of the stations (as indicated in Section 4.2.5) and the revised name, and where originally planned stations were combined or removed.

**Table 6-2**  
**Revised Station Names**

ORIGINAL NAME	CITY	REVISED LPA NAME	CITY	REASON FOR MODIFICATION
Portola Plaza	Monterey	Custom House Plaza <sup>1</sup>	Monterey	Relocation of terminus station
Figueroa	Monterey	--	--	Removed due to proximity to adjacent station
El Estero Park	Monterey	--	Monterey	Combined with adjacent station
Naval Postgraduate School	Monterey	Naval Postgraduate (Sloat Avenue)	Monterey	Shifted to the west and combined with adjacent station
Casa Verde	Monterey	Casa Verde Way	Monterey	--
Contra Costa	Seaside/ Sand City	Downtown Seaside (Contra Costa Street)	Seaside/ Sand City	Re-named to better represent neighborhood
Playa	Seaside/ Sand City	Sand City (Playa Avenue)	Seaside/ Sand City	Re-named to better represent neighborhood
First Street	Seaside	<i>First Street</i>	Seaside	Moved to Phase 2 to accompany future development
University	Marina	Eighth Street	Marina	Re-named to associate with Eighth Street transit center
Palm	Marina	Marina Civic Center (Palm Avenue)	Marina	Re-named to better represent neighborhood
Reservation Road	Marina	Downtown Marina (Reservation Road)	Marina	Re-named to better represent neighborhood
Beach	Marina	Beach Road	Marina	--
Marina Station	Marina	Marina Green Drive	Marina	Re-named to better represent neighborhood
<i>Blackie Road</i>	Castroville <sup>1</sup>	<i>Blackie Road</i>	Castroville <sup>1</sup>	--
<i>Castroville</i>	Castroville <sup>1</sup>	--	--	Removed due to shift in commuter rail station to Blackie Rd

Stations included in the LRT-2 alternative, but not the LRT-1 alternative are shown in italics

<sup>1</sup> Castroville is a community planning area within unincorporated County of Monterey

Project station locations are shown in **Figure 6-2**.

Each station will consist of a low-level platform providing level boarding for passengers with various amenities. **Figure 6-3** depicts a typical station layout and amenity package. A 2-foot wide tactile strip will be installed along the guideway facing the platform edge. One stand alone (i.e., no communications

connections) ticket vending machine will be installed on each platform. At the Eighth and First Street Stations within the former Fort Ord area, vertical access facilities (staircase and elevator) are assumed for connection with adjacent streets.

### **6.3.2 Maintenance**

A new layover facility for inspection and maintenance of light rail transit facilities is included as part of Phase 1 of the project. There are two possible locations for the maintenance facility, as depicted in **Figure 6-4**. Both locations site the facility on lands owned by TAMC or MST.

The planned facility will be responsible for the maintenance, repair and storage of the light rail transit vehicles, and will likely include offices and parking for maintenance employees and train operators. The facility will be sized to accommodate 15 vehicles, each vehicle being 103 feet in length, or 10 vehicles, each vehicle being 136 feet in length. Two service/repair bays and three layover tracks are anticipated at the facility.

Maintenance activities to be performed at the facility are anticipated to include daily refueling, inspection, and cleaning. In addition, the facility will be used to perform preventative and periodic maintenance, and unscheduled repairs. It is anticipated that up to 20 employees will staff the facility. See Chapter 6 of the *Conceptual Plans for Track Restoration*, dated October 2010 and appended to Alternatives Analysis Volume 2, for conceptual site plans and detailed space and equipment requirements for the maintenance facility. The cost of the new maintenance facility is included in the capital cost estimate provided in Section 6.6.1.

### **6.3.3 Property Acquisition**

Some property acquisition will be required as part of the proposed action. The acquisition of property is associated with development of park-and-ride lots at Casa Verde Way, Playa Avenue, and the Naval Postgraduate School (Sloat Avenue), and for local street circulation improvements near the SR-1/Fremont Boulevard interchange in Seaside and Sand City. In Phase 2, property will be leased or purchased to accommodate local trackage adjacent to the Union Pacific Coast Main Line in Castroville.

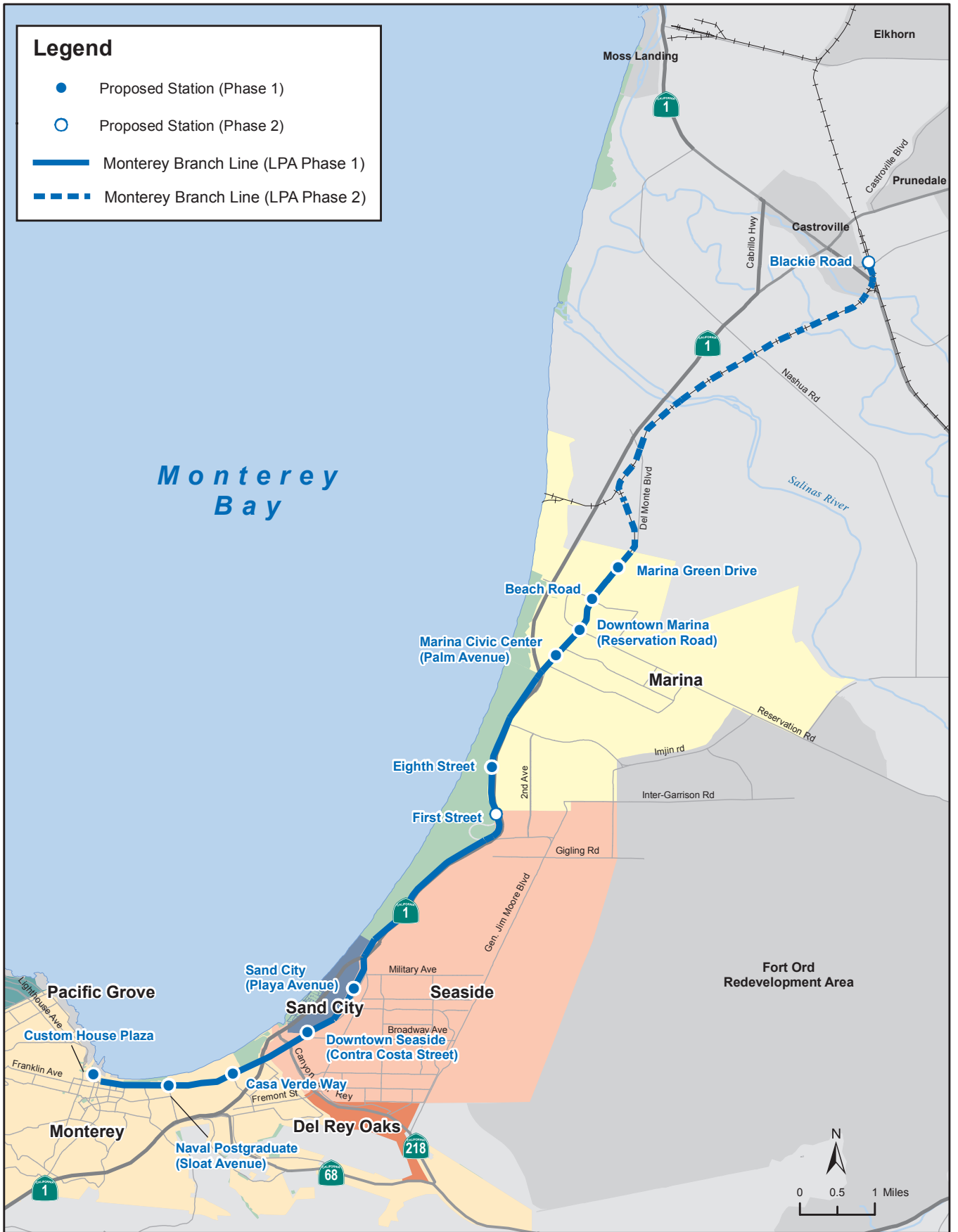


FIGURE 6-2  
 LOCALLY PREFERRED  
 ALTERNATIVE STATION LOCATIONS

**Figure 6-3: Typical Station Layout and Amenity Package**



The potential maintenance and layover facility locations are shown in **Figure 6-4**.

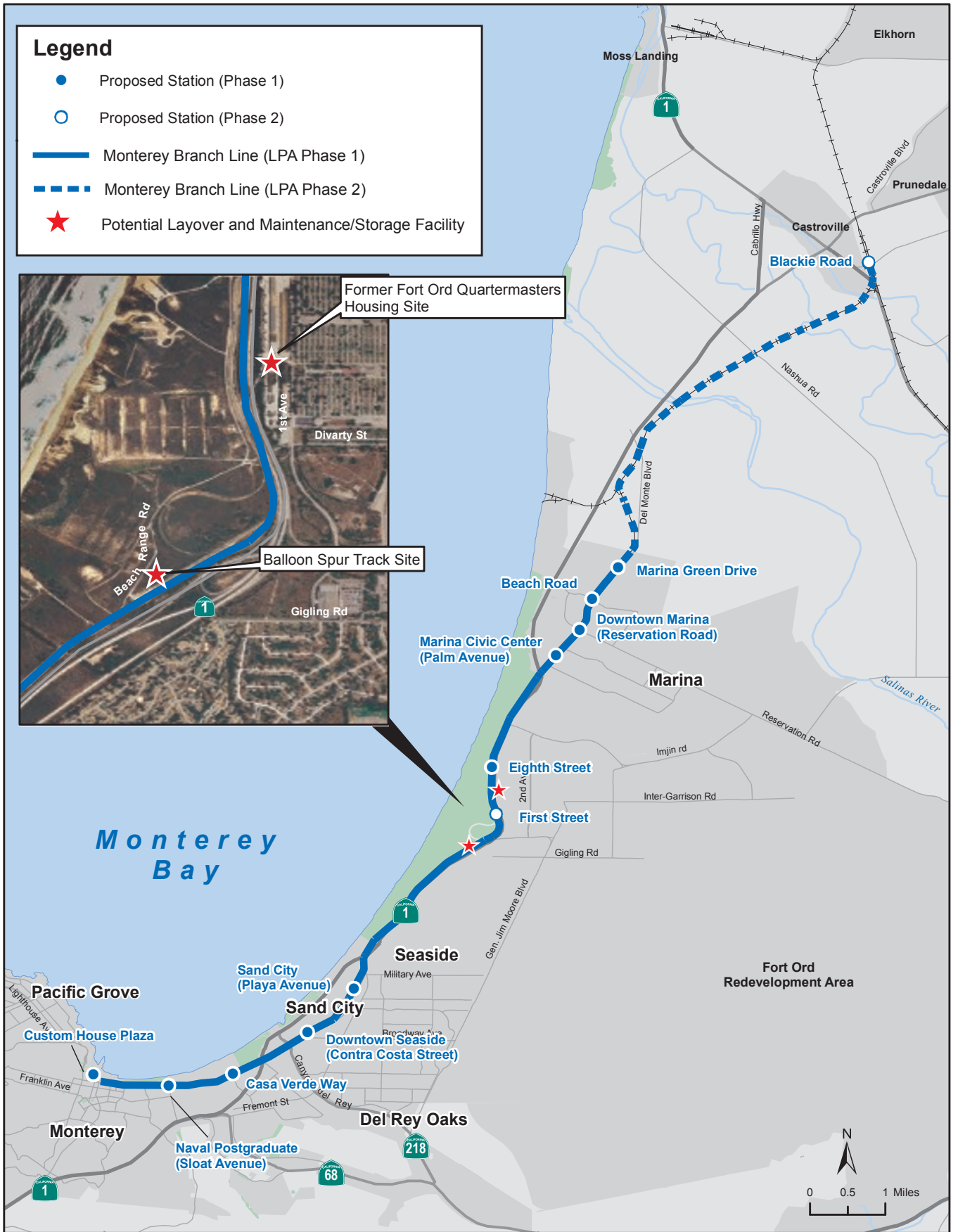


FIGURE 6-4  
POTENTIAL LAYOVER AND  
MAINTENANCE FACILITY LOCATIONS



## 6.4 Ridership

Travel demand forecast models were updated and refined following completion of the alternatives evaluation described above. Therefore, ridership forecasts are somewhat modified from what was presented for LRT-1 and LRT-2 in the previous chapter. The ridership forecasts presented in this chapter supplant those previously provided. **As in the previous chapter, the commuter rail extension to Salinas is not assumed in the ridership forecasts.**

### 6.4.1 Transit Ridership Forecasts

This section summarizes forecasted light rail transit station boardings for the locally-preferred alternative. The boardings represent an average weekday condition and are developed based on results of the travel demand model forecasting procedures. The boardings at each station are influenced somewhat by the model’s depiction of the connections at each station. The station boardings should therefore be viewed as estimates, recognizing that some station’s boardings may occur at adjacent stations instead, particularly when stations are relatively closely spaced. Total daily transit trips within Monterey County with each phase of the locally-preferred alternative are shown in **Table 6-3**. Enhanced bus and no-build ridership forecasts are presented for comparison.

**Table 6-3**  
**Total Daily Transit Trips (Systemwide)**

ALTERNATIVE	2015	2035
No-build	13,360	15,927
Enhanced bus	13,855	16,694
Phase 1 initial segment	15,539	18,797
Phase 2	-- <sup>1</sup>	19,694
Enhanced bus percent change <sup>2</sup>	3.7%	4.8%
Phase 1 percent change <sup>2</sup>	16.3%	18.0%
Phase 2 percent change <sup>2</sup>		23.7%

<sup>1</sup> Phase 2 is not anticipated to be operational by 2015.

<sup>2</sup> Percentage change calculated relative to the No-Build scenario.

Source: Parsons

**Table 6-4** shows the forecast 2015 Phase 1 and 2035 Phase 2 boardings by station and for the feeder bus services. Under the Phase 1 alternative, four of the stations are forecast to serve about two-thirds of the total number of boardings on the light rail system. The 2035 Phase 2 alternative provides similar results. The two additional stations included in Phase 2, at First Street and Blackie Road, are projected to serve about five percent and four percent of the light rail system boardings, respectively.



**Table 6-4**  
**Locally Preferred Alternative Transit Boardings by Station**

TRANSIT STATION	2015 PHASE 1		2035 PHASE 2	
	AVERAGE WEEKDAY BOARDINGS	SHARE OF LRT WEEKDAY BOARDINGS	AVERAGE WEEKDAY BOARDINGS	SHARE OF LRT WEEKDAY BOARDINGS
<b>Light Rail Boardings</b>				
Custom House Plaza	600	28%	1,225	30%
El Estero/Park <sup>1</sup>	50	2%	75	2%
USN Postgraduate School <sup>1</sup>	50	2%	75	2%
Casa Verde	125	6%	175	4%
Contra Costa	300	14%	475	12%
Playa	250	12%	400	10%
First Street <sup>2</sup>	—	—	200	5%
University	150	7%	325	8%
Palm	175	8%	275	7%
Reservation Road	125	6%	200	5%
Beach	50	2%	75	2%
Marina Station	250	12%	375	9%
Blackie Road <sup>2</sup>	—	—	175	4%
<b>Sub-Total</b>	<b>2,125</b>	<b>100%<sup>3</sup></b>	<b>4,050</b>	<b>100%<sup>3</sup></b>
<b>Feeder Service Bus Boardings</b>				
Re-aligned Route 20	1,500	—	1,800	—
<b>Total</b>	<b>3,625</b>	<b>—</b>	<b>5,850</b>	<b>—</b>

<sup>1</sup>El Estero Park and USN Postgraduate School stations were subsequently consolidated at a midpoint (Sloat Avenue). It is anticipated that boarding/alighting activity at the consolidate station will be approximately equal to the combined forecast activity at the El Estero Park and Naval Postgraduate School stations as identified in the table above.

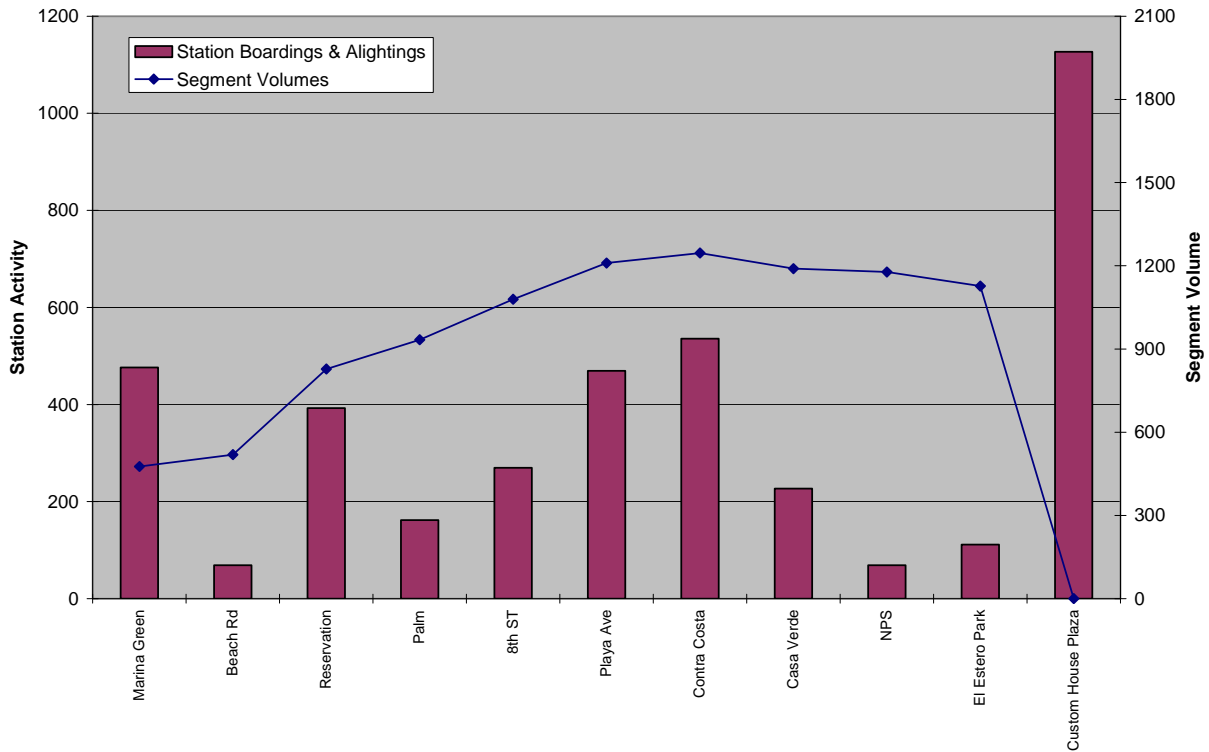
<sup>2</sup>1st Street and Blackie Road stations are only included in the Phase 2 alternative.

<sup>3</sup>Total may not add to 100% due to rounding.

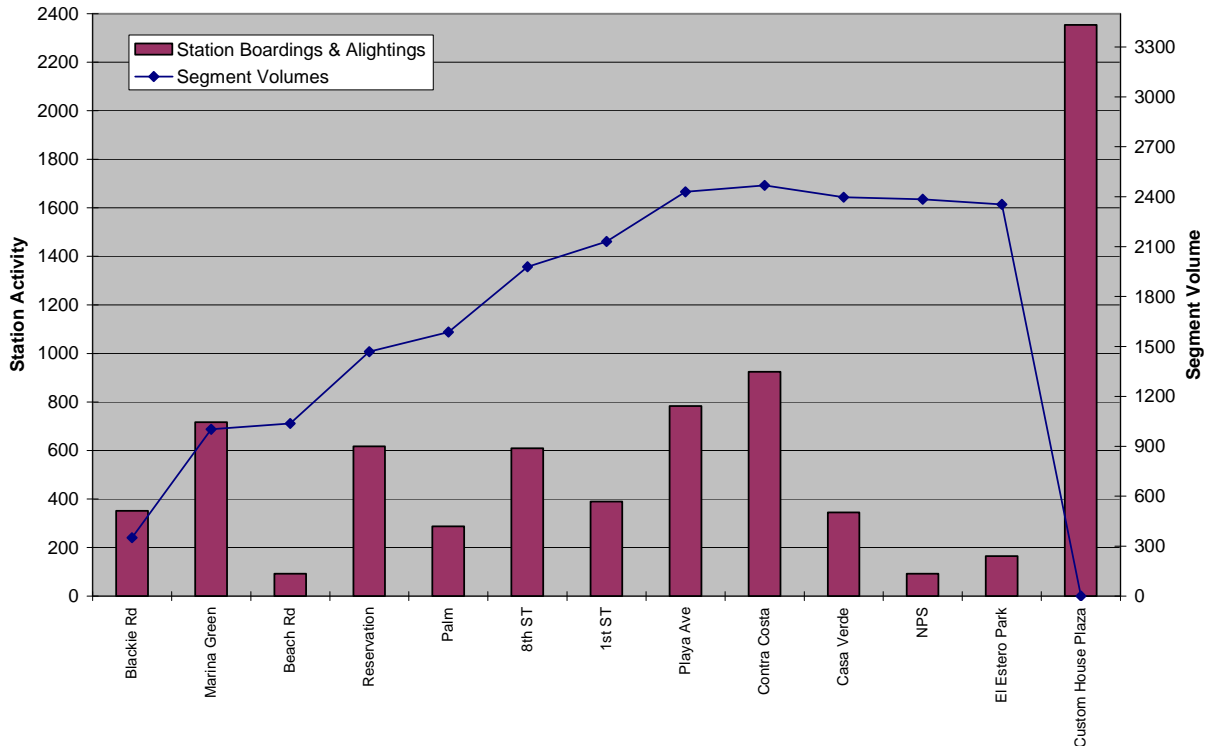
Source: Parsons

**Figures 6-5 and 6-6** depict boarding locations by station and line-segment volumes for 2015 with Phase 1 and 2035 with Phase 2, respectively. Only those boardings on the light rail service are shown.

**Figure 6-5: 2015 Locally-Preferred Alternative Phase 1**  
**Boardings/Alightings and Segment Volumes**



**Figure 6-6: 2035 Locally-Preferred Alternative Phase 2**  
**Boardings/Alightings and Segment Volumes**



### 6.4.2 Park-and-Ride Activity

The locally-preferred alternative definition allows for parking at many of the potential fixed-guideway stations. However, in modeling the fixed-guideway alternative, park-and-ride availability was limited to three locations: Blackie Road, Marina Green, and Eighth Street. The park-and-ride analysis was limited to these locations because generalized park-and-ride modeling procedures were most applicable to more rural locations. Furthermore, the park-and-ride procedures were limited to modeling only peak period activity. This is consistent with the notion that the majority of park-and-ride transit riders are typically home-based-work trips. The modeled project park-and-ride demand is reported in **Table 6-5**.

**Table 6-5**  
**Peak Period Park-and-Ride Demand by Alternative**

ALTERNATIVE	BLACKIE ROAD	MARINA GREEN	EIGHTH STREET	TOTAL
2015 Phase 1	16	51	44	111
2035 Phase 1	26	90	139	255
2035 Phase 2	54	107	152	313

*Source: Parsons*

## 6.5 Overall LPA Project Benefits

The proposed project is anticipated to result in a number of beneficial impacts including the following:

- *Traffic and Transportation*—Implementation of the proposed project is anticipated to reduce the number of single passenger automobile trips and increase transit usage. It is also expected to improve intra- and inter-county travel commute times. Locally, the proposed project, as mitigated, would not adversely affect intersection level of service operations and, in certain instances, would actually improve traffic movements.
- *Air Quality*—The proposed project is not anticipated to result in adverse regional air emissions due to operation of the light rail trains. Moreover, reduced personal automobile use would lower overall vehicle emissions. No carbon monoxide “hot spots” are anticipated to result due to implementation of the proposed project. Similarly, greenhouse gas emissions would also not be anticipated to be adverse.
- *Energy*—By providing an alternative to single-occupancy vehicles, the proposed project would attract riders seeking to avoid congested streets and highways; therefore, it would slightly reduce the consumption of energy by automobiles, vans and small trucks using gasoline or diesel fuel. These impacts would be considered beneficial as persons shift from less energy-efficient modes (i.e., autos, vans and trucks) to an energy-efficient mode (i.e., light rail transit).
- *Parks and Recreation*—The proposed project will provide increased access to parks and recreation facilities located within close proximity of the rail alignment. In addition, it would also facilitate access to the beach and recreational areas located along Monterey Bay.
- *Land Use and Planning*—The proposed project will facilitate the implementation of transit-oriented developments, including mixed use and commercial land uses. Transit projects can encourage these developments due to increased patronage of these areas. Land use plans for the jurisdictions in which the alignment is located have developed general and master plans which

either encourage or are compatible with these uses. **Figure 6-7** illustrates how the project station locations are well suited to capturing projected residential and employment growth in urban Monterey County.

## 6.6 Cost Estimates and Financial Plan

Total and annualized capital and operating and maintenance costs are presented in this section for the locally-preferred alternative Phase 1 (generally equivalent to the LRT-1 segment) and Phase 2 configuration of the locally-preferred alternative (generally equivalent to the LRT-2 segment). The genesis of the alternatives is documented in the *Conceptual Plans for Track Restoration Report*, dated October 2010, and operating plans summarized in the *Operations and Maintenance Cost Methodology Report*, dated October 2010. These documents are appended to Alternatives Analysis Volume 2.

Capital costs have been adjusted to include the value engineering proposals described in Section 6.1 and the reallocation of costs and deferral of certain station improvements in Section 6.4, which reduce costs relative to those presented in Chapter 5 for the LRT-1 and LRT-2 alternatives. These changes do not reduce the overall benefits of the project, including ridership.

### 6.6.1 Capital Cost Estimate

Project capital costs can be categorized into three distinct phases. TAMC will oversee the project through to completion. This includes management of the design and construction of all project elements.

#### 6.6.1.1 Right-of-Way Acquisition Phase

In 2003, TAMC purchased portions of the branch line right-of-way. A total of \$9,238,000 in California State Proposition 116 funds were used for this purpose. This amount represents a sunken investment insofar as the property was obtained, whether for the proposed project or other future use. Similarly, the cities of Monterey and Seaside purchased portions of the Monterey Branch Line right-of-way between Contra Costa Avenue and Washington Street using State of California funding authorized by Senate Bill 620 in 1982. This funding (\$2,961,000) was provided for the purpose of developing the property for mass transit usage. The cost for the right-of-way acquisition phase was \$12,199,475 in YOE dollars.

#### 6.6.1.2 Planning and Preliminary Design Phase

During this phase of the project (2003 to 2011), funds from a variety of sources have been used to prepare the alternatives analysis, conceptual design, and environmental documents. These funding sources include: Federal Highway Administration Congestion Mitigation and Air Quality Improvement Funds, Regional Surface Transportation Program funds, State Transportation Improvement Program funds, California State Proposition 116 funds, California Assembly Bill 2206 funds, and MST local transit funding. The total cost for this phase is \$5,459,800 in YOE dollars.

#### 6.6.1.3 Project Development Phase

Following planning and design efforts, this phase of the project will entail the construction and ultimate implementation of light rail transit service on the Monterey Peninsula. Funding sources for these activities

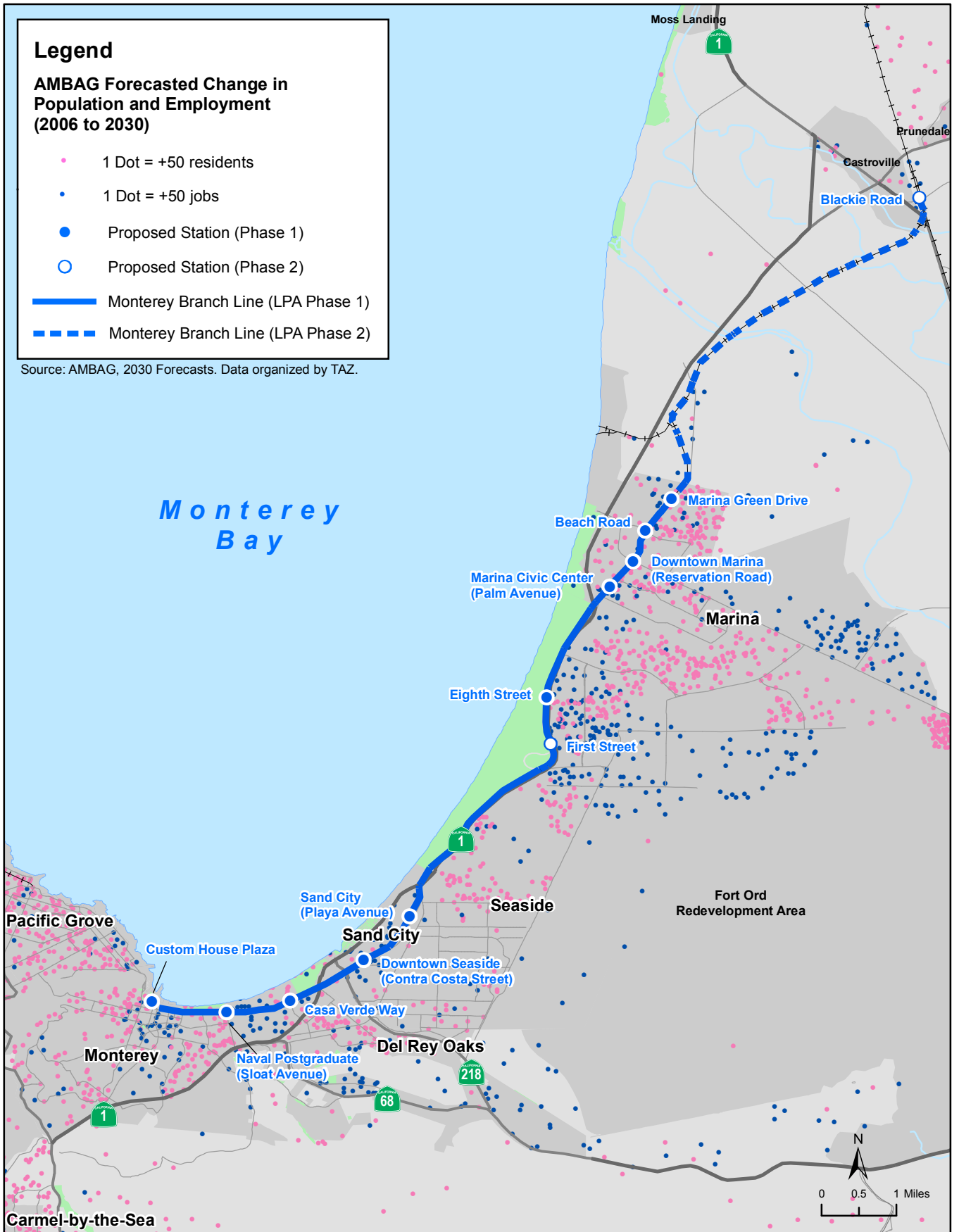


FIGURE 6-7  
PROJECT STATION  
PROXIMITY TO ANTICIPATED GROWTH

will include: FTA Small Starts Section 5309 funds, State Transportation Improvement Program funds, Fort Ord Reuse Authority development fees, TAMC development impact fees, and other state and local funds. The total funding amount required for this phase is \$164,439,000, expressed in YOE dollars.

Capital costs are summarized in **Table 6-6** for the standard FTA Cost Categories for Capital Projects. Please see Alternatives Analysis Volume 3, dated February 2011, for cost estimate details and capital cost estimate basis and unit costs worksheets.

**Table 6-6**  
**Capital Costs by Category for Locally Preferred Alternative (YOE \$ in millions)**

PHASE	COST CATEGORY									TOTAL COST
	GUIDEWAY/ TRACK	STATIONS	SUPPORT FACILITIES	SITWORK	SYSTEMS	RIGHT-OF-WAY	VEHICLES	PROF SERVICES	UNALLOCATED CONTINGENCY	
Phase 1	\$21.542	\$10.817	\$11.205	\$26.580	\$15.003	\$3.806	\$39.006	\$19.078	\$17.402	\$164.439
Phase 2	\$20.695	\$2.038	\$1.360	\$12.021	\$5.864	\$0	\$31.204	\$9.523	\$11.763	\$94.470

Source: Parsons

The Guideway/Track category includes track vibration and noise damping costs. The Support Facilities category includes maintenance facilities and maintenance yard track work. The Sitework category includes demolition, utility relocation, hazardous materials remediation, environmental mitigation, pedestrian/bike access and accommodation, and other indirect construction costs. The Right-of-Way category includes land purchases and the relocation of businesses within the proposed alignment.

Project development phase capital cost data is summarized for total cost in base year dollars, year of expenditure dollars and the annualized cost in **Table 6-7**.

**Table 6-7**  
**Summary of Capital Cost Estimates for Locally Preferred Alternative**

SERVICE FEATURES	TOTAL COST (BASE YEAR \$)	TOTAL COST (YOE \$)	ANNUALIZED COST (2011 \$)
Phase 1 - Monterey to Marina	Phase 1—\$144.350M	Phase 1—\$164.439M	Phase 1—\$11.828M
	Phase 2—\$ 83.056M	Phase 2—\$ 94.470M	Phase 2—\$ 7.258M
Phase 2 - Marina to Castroville	Total \$227.506M	Total \$258.909M	Total \$19.086M

### 6.6.2 Capital Cost Funding

Funding sources for capital costs associated with the Monterey Peninsula Fixed-Guideway project include FTA/Federal Highway Administration Congestion Mitigation and Air Quality Improvement Funds and Regional Surface Transportation Program funding from federal agencies. State of California funding will include Proposition 116 rail bond funds, STIP–Public Transportation Account funds, and Traffic Congestion Relief Program Funds released by Assembly Bill 2206, related to the right-of-way cost associated with the former Fort Ord facility. Local contributions will be derived from local transportation



impact fees and contributions from local partner agencies. A proposed application for a Federal Transit Administration Small Starts funding grant in the amount of \$75 million is intended to fill the gap between the available federal, state, and local funding and the estimated total project cost.

#### *6.6.2.1 Federal Funding—FTA Section 5309 Small Starts*

TAMC anticipates that construction of a fixed-guideway system serving the Monterey Peninsula will require federal funding, in addition to local and state financial resources. To be eligible for federal transit funding, applicants must follow the competitive New Starts planning and project development process. The Federal Transit Administrations' discretionary Section 5309 New Starts program is the primary financial resource for supporting locally-planned, implemented, and operated transit fixed-guideway capital investments. FTA further divides New Start projects into three categories based on overall project costs (New Starts, Small Starts, and Very Small Starts).

FTA Small Starts requirements related to eligibility are summarized below:

- Capital costs associated with new fixed-guideway systems, extensions, and bus corridor improvements will be eligible for grants. Grant requests must be for less than \$75 million in Small Starts funds, and total project costs must be less than \$250 million.
- Projects must include fixed-guideway service for at least 50 percent of the project length during peak demand, or
- Proposals for a corridor bus project must include, at a minimum:
  - ♦ Transit stations
  - ♦ Traffic signal priority and/or pre-emption
  - ♦ Low-floor or level boarding buses
  - ♦ Premium service branding
  - ♦ 10-minute peak headways and 15-minute off-peak headways for at least 14 hours per day.

#### *6.6.2.2 Local and State Funding*

A major funding source for this proposed light rail was originally to come from revenues realized as a result of Measure Z, a sales tax measure which narrowly failed at the polls in November 2008. This remains a viable funding source for future phases or operations of the locally-preferred alternative. At the present time, however, and in light of Measures Z's failure, this revenue shortfall must be offset by developing a different mix of local funding. The specific state and local funding sources which are expected to contribute to project costs are discussed below.

***State Proposition 116 Funding***—Proposition 116, approved by California voters in 1990, was the first sizable statewide rail capital program developed exclusively for rail transit in many years. It commits funds to various rail use projects, including light rail, subway, and commuter rail. Right-of-way preservation is included, as are bicycle commuter projects and public transit projects in non-urban counties. Funding provided by Proposition 116 is specifically targeted, mostly toward expanding existing projects or systems. A total of \$14.46 million in Proposition 116 funds has been committed to the Monterey Branch Line Fixed-Guideway project by the California Transportation Commission, of which \$9.2 million was expended to purchase the Monterey Branch Line right-of-way in 2003. At the time of purchase, TAMC received a “Letter of No Prejudice” from the Federal Transit Administration allowing

for use of the right-of-way funding to be eligible for matching Federal grant monies. This Proposition 116 funding remains part of the Financial Plan.

**2006 STIP Augmentation/Future STIP Funding**—The STIP is a state-wide funding document for major transportation improvement projects. The California Transportation Commission sets the total funding estimates, county shares and the criteria for funding eligibility. Funding from the 2006 STIP fund category (\$3.00 million) includes the reallocation of funds to the proposed fixed-guideway project from highway construction projects to which the funds were originally earmarked. Similarly, funding from the future STIP fund category includes the allocation of funds to this project that might otherwise be spent on other local transportation projects. Of these amounts, \$7,256,000 has been “secured” from the CTC in addition to the \$3,000,000 identified earlier as 2006 STIP augmentation. Together, this \$10.3 million of funding is expected to be utilized for preliminary and final design of the locally-preferred alternative project.

**FORA Development Fee**—The Fort Ord Reuse Authority (FORA) is authorized to levy development fees on development projects within the area of the former Fort Ord. These fees are intended to mitigate the costs associated with the impact of development of the former Fort Ord. Most of the development fees are used to finance the capital improvement obligations defined under the Fort Ord Base Reuse Plan (as adopted by the FORA board in June 1997. These obligations are detailed in the FORA Capital Improvement Program FY 2008/2009 through 2021/2022 as approved by the FORA Board on June 13, 2008.

The FORA capital improvement program obligation for transportation/transit projects currently amounts to \$121.45 million. The transportation/transit mitigation element constitutes more than 70 percent of the total costs of all infrastructure projects identified by the capital improvement program. Of this amount, \$61.72 million is earmarked for regional and local off-site highway improvements, plus transit capital projects. Of this amount, \$21.09 million is identified for improving SR-1 in Seaside and Sand City, plus constructing a new interchange at Monterey Road.

Given the failure to pass sales tax Measure Z by the required two-thirds super majority vote, the two SR-1 transportation projects identified as mitigation obligations of the FORA capital improvement program, cannot be assured of funding by other means in the near term, before 2014 or 2021. Therefore, to fulfill in part the FORA base reuse plan mitigation obligation, development fees otherwise levied on the proposed TAMC/MST/Marina Transit Oriented Development project are assumed to be diverted to the fixed-guideway project, as an interim, partial mitigation for base reuse plan transportation impacts. The FORA capital improvement program identifies monies that were originally projected to be spent on improvements to the Eighth Street Transit Center in Marina (\$2.36 million) and for transit vehicle purchases (\$7.18 million) would be spent to fund elements part of the locally-preferred alternative.

**Other Local Funding**—The Transportation Development Act of 1971 extended sales tax to gasoline purchases and earmarked one-quarter of one cent of all sales tax proceeds for public transportation improvements in the county where the revenues are generated. Jurisdictions may use the Local Transportation Fund amounts for streets and road purposes if a finding is made by the jurisdiction involved that there are “no unmet transit needs that are reasonable to meet.” The reasonableness criteria

are defined by each Regional Transportation Agency administering funds based on the Transportation Development Act.

**Table 6-8** outlines a potential financing plan for the capital cost.

### **6.6.3 Operations and Maintenance Cost Estimate**

The estimated annual operations and maintenance cost for the locally-preferred alternative, Phase 1, service plan is shown below in **Table 6-9**. Compared with the estimates for the alternatives analysis evaluation presented in Chapter 5, the revised annual operating cost of \$3.6 million is approximately 60 percent of the estimated \$6.0 million annual operating cost for the LRT-1 alternative. The lower cost shown in Table 6-9 is the result of a streamlining of the originally planned LRT-1 service, as discussed earlier in this chapter, including a reduction in service frequency during the initial years of revenue operations to better match initial ridership demand for the new service.

The operating cost forecast incorporates modifications to one existing MST route operating along the Monterey Peninsula in order to eliminate bus service redundant with the first phase of LRT operation. Bus route 20 would be modified to operate only between Salinas and Marina, connecting to the planned Marina Station, instead of extending into the City of Monterey. For the purpose of the operating cost projections, except for the modification of Route 20, no reduction in transit service is assumed on the MST network with implementation of the proposed project. The operating cost shown in Table 6-9 is an estimate of the net increase in total annual transit system operating costs during the first full year of locally-preferred alternative, Phase 1, service. It does not reflect any offsetting fare revenues.

A detailed analysis of the operations and maintenance costs associated with the locally-preferred alternative is provided in the *Operations and Maintenance Cost Methodology Report*, dated October 2010 and appended to Alternatives Analysis Volume 2.

**Table 6-8**  
**Monterey Peninsula Fixed Guideway Capital Cost Financial Plan for LPA Phase 1 (YOE \$)**

TASKS	FISCAL YEARS	YOE COSTS	FUNDING SOURCES	YOE COST	SECURED	SPENT	PROPOSED
<b>ADVANCE RIGHT-OF-WAY ACQUISITION PHASE</b>							
Land Purchase	2003	\$ 9,238,475	P116	\$ 9,238,475	\$9,238,475	\$ 9,238,475	\$ 0
Land Purchase	1983	\$ 2,961,000	SB620	\$ 2,961,000	\$2,961,000	\$ 2,961,000	\$ 0
			<b>Subtotal</b>	<b>\$ 12,199,475</b>	<b>\$12,199,475</b>	<b>\$12,199,475</b>	<b>\$ 0</b>
<b>Phase Total</b>		<b>\$ 12,199,475</b>					
<b>PLANNING AND CONCEPTUAL DESIGN PHASE</b>							
Alternatives Analysis, Conceptual Design, Environmental Document	2003–2011	\$ 5,459,800	CMAQ	\$ 400,000	\$ 400,000	\$ 400,000	\$ 0
			AB2206	\$ 194,433	\$ 194,433	\$ 194,433	\$ 0
			MST/LTF	\$ 39,000	\$ 39,000	\$ 39,000	\$ 0
			RSTPI	\$ 494,842	\$ 494,842	\$ 332,617	\$ 0
			STIP	\$ 4,200,000	\$ 4,200,000	\$ 2,211,300	\$ 0
			P116	\$ 131,525	\$ 131,525		\$ 0
			<b>Subtotal</b>	<b>\$ 5,459,800</b>	<b>\$ 5,459,800</b>	<b>\$ 3,177,350</b>	<b>\$ 0</b>
<b>Phase Total</b>		<b>\$ 5,459,800</b>					
<b>PROJECT DEVELOPMENT PHASE</b>							
PS&E, Final Design	2011–2013	\$ 9,026,000	STIP	\$ 6,026,000	\$ 6,026,000		\$ 0
			2006 STIP Augmentation	\$ 3,000,000	\$ 3,000,000		\$ 0
			<b>Subtotal</b>	<b>\$ 9,026,000</b>	<b>\$ 9,026,000</b>	<b>\$ 0</b>	<b>\$ 0</b>
ROW	2011–2012	\$ 3,806,000	State/Local	\$ 3,806,000	\$ 0		\$ 3,806,000
			<b>Subtotal</b>	<b>\$ 3,806,000</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 3,806,000</b>
Construction	2013-15	\$112,601,000	Federal SS	\$ 75,000,000	\$ 0		\$ 75,000,000
			FORA–Hwy 1	\$ 14,000,000	\$ 0		\$ 14,000,000
			Dev. Fee	\$ 2,400,000	\$ 0		\$ 2,400,000
			Private Sector/In Kind Match	\$ 6,781,000	\$ 0		\$ 6,781,000
			State/Local	\$ 14,420,000	\$ 0		\$ 14,420,000
			<b>Subtotal</b>	<b>\$112,601,000</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$112,601,000</b>
Vehicles	2013-14	\$ 39,006,000	State/Local	\$ 39,006,000	\$ 0		\$ 39,006,000
			<b>Subtotal</b>	<b>\$ 39,006,000</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 39,006,000</b>
<b>Phase Total</b>		<b>\$164,439,000</b>					

Source: Parsons

**Table 6-9**  
**Locally-Preferred Alternative, Phase 1**  
**Change in Operations and Maintenance Costs (FY 2010 \$)**

COST FUNCTION	BASIS	SERVICE	CHANGE FROM NO-BUILD	UNIT COST	WEIGHTED COST FACTOR	LPA PHASE 1 ANNUAL COST	
Vehicle operations	Hours	Local	(5,850)	\$50.81	1.0	\$ (297,239)	
	Hours	LRT-1	15,890	\$50.81	1.0	807,371	
	Miles	Local	(49,107)	\$ 0.96	1.0	(47,143)	
	Miles	LRT-1	317,800	\$ 0.96	2.0	610,176	
Vehicle maintenance	Miles	Local	(49,107)	\$ 1.36	1.0	(66,786)	
	Miles	LRT-1	317,800	\$ 1.36	3.0	1,296,624	
Facilities maintenance	MOV	Local	(2)	\$15,051	1.0	(30,102)	
	S&C	Route miles	LRT-1	10 × 0.30	\$98,598	1.0	295,794
	MOW	Guideway miles	LRT-1	10 × 0.315	\$98,598	1.0	310,584
	Yard	Facilities	LRT-1	1	\$98,598	1.0	98,598
	Station	Stations	LRT-1	10 × 0.40	\$98,598	1.0	394,392
	TVM	Units	LRT-1	14 × 0.095	\$98,598	1.0	131,135
	Stores	Fleet vehicles	LRT-1	6 × 0.065	\$98,598	1.0	38,453
	General administration	MOV	Local	(2)	\$59,433	1.0	(118,866)
	MOV	LRT-1	4	\$59,433	1.0	237,732	
<b>Total (rounded)</b>						<b>\$3,661,000</b>	

Source: Parsons

#### 6.6.4 Operations and Maintenance Cost Funding

It is expected that TAMC will authorize the local transit service provider, MST, with the operational responsibility for the fixed-guideway service. MST’s current transit service offerings and service area are described in Section 2.1.4. As MST does not currently operate any LRT service, operational details and responsibilities are still being refined. A formal operating agreement will be developed during a later project phase.

It is anticipated that net public operating costs for the locally-preferred alternative (i.e., transit operations and maintenance expense subsidization) will be met by a combination of passenger fares and other local fund sources not currently being used to fund transit operations. This funding strategy would avoid adversely affecting the MST operating budget for existing transit services.

##### 6.6.4.1 Existing Transit Operations Funding

MST currently has expenses of just under \$28 million to operate bus and paratransit service in its service area within Monterey County. Revenue to match those expenses comes from a variety of local, state and federal sources. Table 6-10 summarizes the current revenue sources for MST to operate transit service.

**Table 6-10**  
**MST Revenue Sources (FY 2011)**

Revenue Source	% of Total Revenue
Bus Fares	24.3%
Federal Grants	25.5%
Local Transportation Fund	38.0%
Investment Income/Other	0.9%
Capital contributions/Special Item	11.4%

The project will identify funding sources outside of those currently used to support MST services. Potential future sources for operating cost subsidization are described in Section 6.6.4.3.

*6.6.4.2 Projected Passenger Fare Revenues*

With the increase in transit trips generated by the locally-preferred alternative, a portion of the operating cost will be covered by passenger fare revenues. Passenger trips and fare revenues for the no-build and locally-preferred alternative are summarized in **Table 6-11**. Under the locally-preferred alternative, Phase 1, fare revenues are expected to increase by approximately \$1.36 million, which is equivalent to about 38 percent of the estimated net annual operating cost of the locally-preferred alternative. (Note: Farebox revenue estimates typically include advertising and other operating income generated by revenue transit vehicles.)

**Table 6-11**  
**Year 2015 Forecast Passengers and Fare Box Revenues (FY 2010 \$)**

	NO-BUILD	LPA PHASE 1
Daily transit trips	13,360	15,539
Daily transit boardings	16,230	17,943
Annual transit trips	4,342,000	5,050,175
Annual transit boardings	5,274,750	5,831,475
Annual passenger revenue	\$8.34M	\$9.70M
<b>Net increase</b>	<b>\$0</b>	<b>\$1.36M</b>

The resulting estimated increase in net public operating costs for the locally-preferred alternative, relative to the no-build condition, after adjusting for offsetting passenger and related operating revenues is summarized in **Table 6-12**.



**Table 6-12**  
**Net Public Cost Increment over No-Build (2010 \$ in millions)**

PARAMETER	NO-BUILD	LPA PHASE 1
Annual operating and maintenance cost	\$26.76	\$30.43
Annual passenger revenue	\$ 8.34	\$ 9.70
<b>Net public cost</b>	<b>\$18.43</b>	<b>\$20.73</b>
<b>Net Increase<sup>1</sup></b>	<b>\$ 0.00</b>	<b>\$ 2.30</b>

<sup>1</sup> Represents change in net public cost with project (LPA cost – No-Build cost)

The approximate \$2.3 million increase in the net public cost will need to be offset through use of funds from other sources, identified in the sections below.

#### 6.6.4.3 Local Funding Sources

A number of local funding sources have been identified by TAMC to offset the net public operating cost identified for the locally-preferred alternative. These funding sources represent revenue opportunities not currently utilized but reasonable options to pursue in the near-term horizon. Potential operating funding sources include:

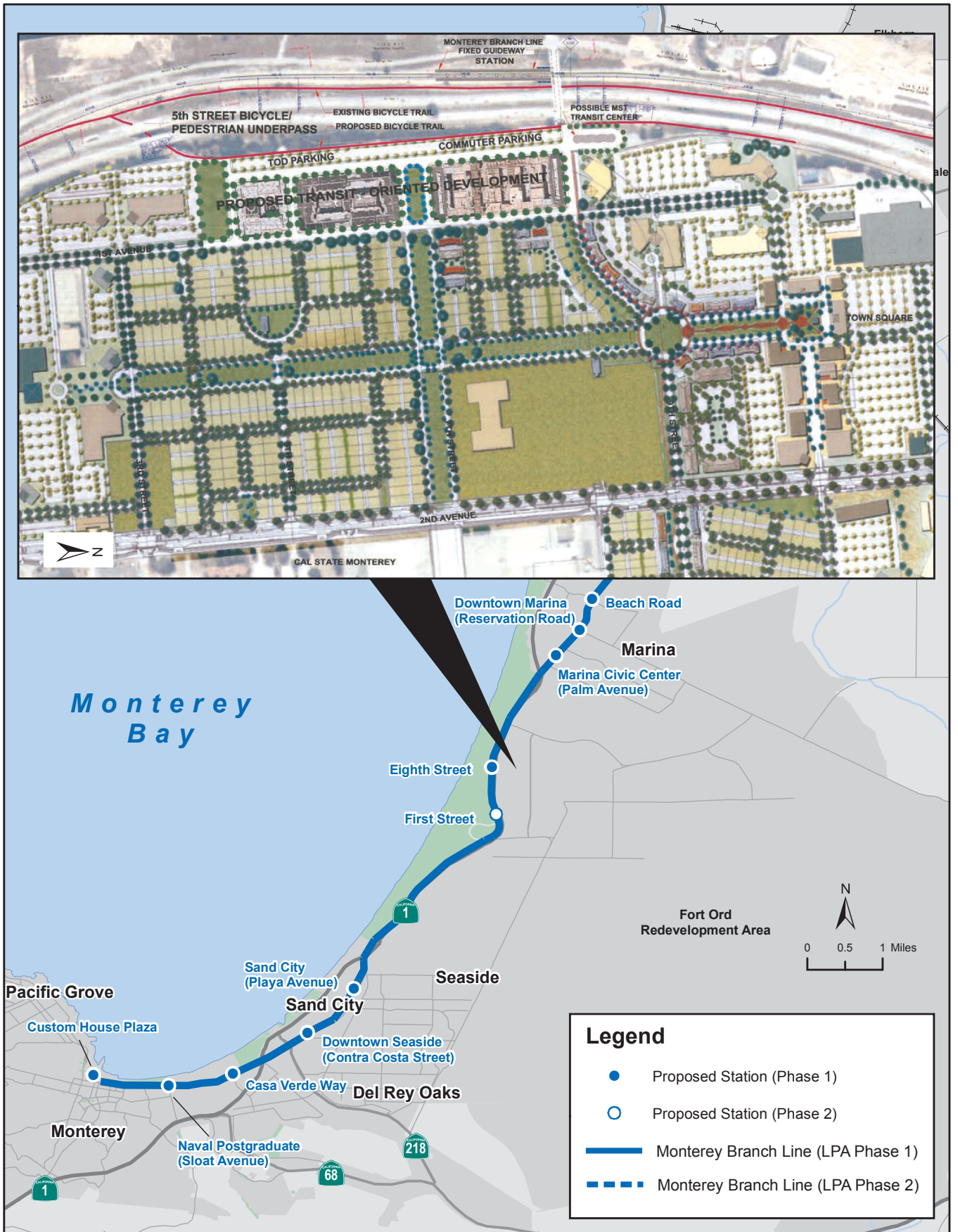
- Development leases
- Water pipeline lease
- Toll revenue
- Transit sales tax

**Development Leases.** TAMC, MST, and Marina currently own developable ocean view property lying immediately east of SR-1, located within the boundaries of the former Fort Ord. West of SR-1, the State of California recently established the Fort Ord Dunes State Park, thereby perpetuating forever an unobstructed view of the Pacific Ocean and the Monterey Bay from this transit-oriented development site.

TAMC is planning on developing approximately 11 acres, exclusive of the supporting roadway network and adjacent commuter park-and-ride lot, of transit-oriented development near the Eighth Street/CSUMB transit center. **Figure 6-8** illustrates the conceptual site plan of the proposed transit oriented development.

TAMC anticipates that land lease proceeds from the transit-oriented development site would be available to support operating costs of the fixed-guideway project. The lease of this site would generate approximately \$2 million annually towards the net public cost of the project.

Currently, TAMC is leasing some of its property along the Monterey Branch Line corridor to businesses along the alignment. It is anticipated that excess land holdings in the corridor, not needed following the project construction phase, can be leased out for additional revenue, particularly with the addition of enhanced transit service in the corridor. At this time, no revenue estimate has been made for these supplemental lease opportunities in the corridor. The lease of corridor right-of-way will be explored further during project design when more information becomes available on right-of-way required for the project and right-of-way available for other uses.



Kimley-Horn  
and Associates, Inc.

FIGURE 6-8  
TRANSIT-ORIENTED  
DEVELOPMENT LOCATION AND SITE PLAN

**Water Pipeline Lease.** The Monterey Bay Regional Desalination Project includes construction and operation of a water desalination facility on the Peninsula that will produce potable water by extracting and purifying brackish groundwater from a basin that has been intruded by seawater due to historical pumping practices. The project is currently in the permitting and design phases and is anticipated to go to construction in early 2013. Components of the project include the construction of pipelines to convey the potable water to population centers in the county. Through the lease of a portion of the Monterey Branch Line right-of-way for the pipeline, TAMC anticipates receiving approximately \$200,000 per year.

**Toll Revenue.** The widening of a heavily traveled portion of SR-156, extending between SR-1 in Castroville and US-101 in Prunedale, is in the planning stages by TAMC. One of the funding alternatives under consideration for the widening project is the implementation of tolling on the facility. Should tolling be implemented, a portion of the tolling revenue may be allocated towards offsetting the operating cost of transit services. Therefore, toll revenue represents a potential future funding source for the project.

**Transit Sales Tax.** Measure Z, a sales tax to pay for the improvement of the transportation network in Monterey County, was brought before the voters in 2008. While obtaining approval from 63% of voters, this measure failed to garner the required 2/3 super-majority to pass. TAMC will be considering a new sales tax ballot measure within the next five years, particularly if active legislation that would lower the threshold is approved. A portion of the sales tax revenues, should the measure be adopted, could be allocated towards supporting operating transit service in the county.

**Other Funding Sources.** Other funding sources may be considered by TAMC to offset the increase in transit operating costs associated with the project. It is anticipated that due to continued population growth in the area, the Local Transportation Fund receipts for the region will increase. This increased funding may support an increase in transit service in the region. Additionally, other operational efficiencies may be achieved in the MST network with the addition of this project. The operating cost analysis provided above only assumed shortening of Route 20, which currently operates adjacent to the Monterey Branch Line corridor. However, MST currently operates 14 additional routes along much of the corridor to be served by the project. It may be possible to truncate some of these routes at planned LRT stations without significantly reducing mobility or impacting system operations. This could represent significant operational efficiencies that may offset some of the net operating cost associated with the project.

**Table 6-13** indicates the forecast annual operating cost funding plan for the project.

**Table 6-13**  
**Operating Costs and Revenues (FY 2010 \$ in millions)**

	<b>COST/REVENUE</b>
<b>Operating Cost</b>	
<b>Annual Net Operating Cost</b>	<b>\$3.66</b>
<b>Revenue Sources</b>	
Net Farebox Revenue	\$1.36
Development Leases	\$2.00
Water Pipeline Lease	\$0.20
Local Funds <sup>1</sup>	\$0.10
<b>Annual Net Revenues</b>	<b>\$3.66</b>

<sup>1</sup> Local funds may include additional lease revenue, toll revenue or a transit sales tax

## **6.7 Comparison of the Locally-Preferred Alternative with the Alternatives Analyzed**

As noted in Section 6.1, the locally-preferred alternative deviated from the previously analyzed alternatives as the result of extensive public outreach and refinements to reduce the project cost. However, these changes are relatively minor and the locally-preferred alternative generally has the same environment effects as the LRT-1 alternative (for locally-preferred alternative Phase 1) and the LRT-2 alternative (for locally-preferred alternative Phase 2). **Table 6-14** quantifies how the locally-preferred alternative compares to the previously analyzed alternatives.

**Table 6-14**  
**Comparison of the Locally-Preferred Alternative with the Alternatives Analyzed**

	ALTERNATIVE AS ANALYZED IN THE ALTERNATIVES ANALYSIS					LOCALLY-PREFERRED ALTERNATIVE	
	ENHANCED BUS	BRT-1	BRT-2	LRT-1	LRT-2	PHASE 1	PHASE 2
<b>Mode</b>	Bus	BRT	BRT	LRT	LRT	LRT	LRT
<b>Ridership on the Alternative<sup>1</sup></b>	3,154	4,443	4,426	4,288	4,383	3,625	5,850 <sup>2</sup>
<b>Number of Stations</b>	N/A	13	15	13	15	10	12
<b>Areas with Significant Environmental Effects</b>	None	Biology	Biology	None	Water Quality	None	Water Quality
<b>Areas with Potentially Significant Environmental Effects</b>	None	Coastal Zones, Hazardous Materials Wetlands, Parklands, and Traffic	Water Quality, Coastal Zones, Hazardous Materials Wetlands, Parklands, and Traffic	Coastal Zones, Hazardous Materials Wetlands, Parklands, Traffic, and Noise/Vibration	Coastal Zones, Biology, Hazardous Materials Wetlands, Parklands, Traffic, and Noise/Vibration	Coastal Zones, Hazardous Materials Wetlands, Parklands, Traffic, and Noise/Vibration	Coastal Zones, Biology, Hazardous Materials Wetlands, Parklands, Traffic, and Noise/Vibration
<b>Capital Cost<sup>3</sup></b>	\$45.600	\$152.720	\$185.962	\$157.553	\$200.135	\$164.439	\$258.909
<b>Net Operating Cost Impact<sup>4</sup></b>	\$4.239	\$7.896	\$8.226	\$6.062	\$8.926	\$3.661	N/A <sup>5</sup>

<sup>1</sup> The ridership listed reflects total ridership on the alignment and new or modified feeder routes (Route 20) projected for 2015, except for LPA Phase 2.  
<sup>2</sup> Ridership shown for LPA Phase 2 is for 2035.  
<sup>3</sup> Capital Costs shown are year-of-expenditure, dollars in millions  
<sup>4</sup> Operating costs for the alternatives analyzed in the alternatives analysis are in 2007 dollars, in millions. Operating costs shown for the LPA Phase 1 is in 2010 dollars, in millions.  
<sup>5</sup> A revised operating cost has not yet been prepared for Phase 2

As shown in the table, the locally-preferred alternative is similar to the LRT-1 alternative. The differences lie in the details of the system characteristics, such as the number of stations, station locations, and the operating plans. The alignments are essentially identical between the locally-preferred alternative and LRT-1. Ridership on locally-preferred alternative Phase 1 is approximately 15 percent lower than what was projected for LRT-1 primarily due to a reduction in service frequency. However, the operating cost for the locally-preferred alternative is approximately forty percent lower, also primarily due to that service frequency reduction and a reduction in the number of stations. The capital cost is within five percent of the previous estimate for LRT-1, with the difference primarily being driven by inflation associated with a later year-of-expenditure.



The table also lists out of the environmental effects of the previous alternatives compared against the locally-preferred alternative. The locally-preferred alternative is anticipated to have very similar environmental effects to LRT-1 and LRT-2 since the mode is the same and the alignments are essentially similar.

## 6.8 Inclusion of Project in Regional Transportation Plan

Subsequent to adoption of the locally-preferred alternative by the TAMC Board of Directors in late 2009, the project was included in the 2010 Regional Transportation Plan, prepared by TAMC. The Regional Transportation Plan provides a basis for the planning and programming of local, state and federal transportation funds to transportation projects in Monterey County. The Plan identifies significant priority projects on the regional transportation network, defined as the funding constrained project list, reasonably expected to be completed given anticipated funding. The Monterey Peninsula Fixed-Guideway project, including both capital and operating cost for LRT service, was included on the funding constrained project list.

The project is also included on the fiscally constrained project list in the AMBAG Long Range Metropolitan Transportation Plan, updated June 2010. This Plan is for the entire three-county Monterey Bay metropolitan region, incorporating the programs and projects specified in the individual county-wide regional transportation plans.

## 6.9 Project Schedule and Implementation

Following completion of this alternatives analysis, the project is will embark on two key steps towards implementation. While environmental issues have been given some review as part of the alternative analysis, a more detailed and comprehensive analysis is required. Environmental review will include a public scoping process to determine the study area and components. The other key step is acceptance into the FTA Small Starts process. TAMC will prepare a Small Starts submittal package and provide to FTA for their review of the project's request for approval to enter Project Development. Acceptance into Project Development allows the project to embark on preliminary and final engineering and design, with the ultimate goal of receiving federal financial assistance for the project's capital costs. See Table 6-15 for the proposed project schedule.



**Table 6-15**  
**Project Schedule**

PHASE	SCHEDULED COMPLETION DATE <sup>1</sup>
<i>Branch line acquisition</i>	2003
<i>Adoption of Locally Preferred Alternative</i>	October 2009
State and Federal Environmental Analysis	June 2011
Design/Engineering	2011-2013
Right-of-Way (if needed)	2012
Construction & Vehicle Procurement	2013-2015
Start of Service	2015

Phases shown in *italics* are currently complete

<sup>1</sup> The schedule noted in this table is consistent with the information presented in the Alternatives Analysis. The project schedule has since been revised, delaying the scheduled completion date of the events not noted as completed. Start of service is now projected for 2017.