

**Summary of the
Dumbarton Rail Corridor
Project Study Report**

May 2004



TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
TRACK IMPROVEMENTS	8
STRUCTURES AND GRADE SEPARATIONS.....	13
STATIONS.....	18
RAILROAD SIGNALS	22
RAILROAD OPERATIONS	23
TRAVEL DEMAND FORECAST	27
ENVIRONMENTAL ANALYSIS	29
RIGHT-OF-WAY	31
COST ESTIMATES	33
FUNDING.....	35
ACKNOWLEDGEMENTS	38

FIGURES

Figure 1: Dumbarton Rail Corridor.....	3
Figure 2: Timeline for Project Phases.....	7
Figure 3: Dumbarton Rail Corridor Track Diagram.....	8
Figure 4: Structures and Grade Separations	13
Figure 5: Henderson Underpass	14
Figure 6: Main Elements of the Existing Dumbarton Bridge	14
Figure 7: Proposed Replacement Structure for Dumbarton Bridge.....	15
Figure 8: Existing Newark Slough Swing Bridge.....	16
Figure 9: Proposed Replacement Structure for Newark Slough	16
Figure 10: Proposed Shinn Connection underneath BART Tracks	17
Figure 11: Alameda Creek Bridge Alignment.....	17
Figure 12: Location of Dumbarton Rail Stations	18
Figure 13: Future Union City Intermodal Station	18
Figure 14: Upgraded Fremont Centerville Station	19
Figure 15: Site Plan of Proposed Newark Station.....	20
Figure 16: Site Plan of Proposed Willow Road Station	21
Figure 17: Right-of-Way Segments	31

TABLES

Table 1: Estimated Number of Trains per Week in Rail Corridor	26
Table 2: Projected Daily Station Boardings	28
Table 3: Right of Way – Temporary Easements, Arrangements and Acquisitions.....	32
Table 4: Capital Costs by Project Element	33
Table 5: Conceptual Operating and Maintenance Costs.....	34
Table 6: Capital Funding Package.....	35
Table 7: Operating and Maintenance Funding Package.....	37

EXECUTIVE SUMMARY

Purpose of the Project Study Report Summary

The purpose of this document, called the “Project Study Report Summary,” is to convey key findings and information from a series of technical reports, which are included in the Dumbarton Rail Corridor Project Study Report (PSR). The series of technical reports include conceptual engineering, environmental studies, and documents from the preliminary engineering and environmental phase. The main findings of the PSR are summarized in this executive summary. More detailed discussions, directly extracted from the technical reports, are contained in the following chapters.

Introduction: Rail Around the Bay

The Dumbarton Rail Corridor (DRC) Project will extend commuter rail service across the Bay between the Peninsula and the East Bay by rehabilitating and reconstructing rail facilities on the existing railroad alignment and right-of-way. Service will consist of six trains originating from the East Bay and traveling west in the morning peak and six trains returning in the evening peak. Daily ridership is projected at approximately 4,800 passengers in 2010 and 6,900 passengers by 2025. The capital cost of this project, including procurement of new train sets, is estimated to be \$300 million. The planning, design and construction phases of the project are expected to take six years, resulting in the start of revenue service in 2010. The San Mateo County Transportation Authority (SMCTA) initiated the PSR in 2003 to be conducted for the DRC to further understand the scope, schedule, and cost for implementing the project.

Background and History

The various segments composing the 20.5-mile DRC have been in active rail service since the turn of the century. Only a relatively short five-mile segment across the Bay has been out of service since the mid-1980s. The long-range planning process for the DRC began in 1991, with a SMCTA-sponsored study evaluating the feasibility of operating a commuter rail service in the corridor. The rail service option was recommended as a long-term strategy, which included future planned rail expansions. In 1994, the San Mateo County Transit District (SamTrans) purchased the Dumbarton Rail Corridor right-of-way between Redwood Junction and Newark Junction as an investment for future freight and/or commuter rail service.

Improvements to the DRC were studied and documented in a report entitled, *Dumbarton Rail Corridor Rehabilitation* (1996). In 1997, SMCTA sponsored the *Dumbarton Corridor Study* to identify short- and long-term transit opportunities in coordination with other regional rail links. Similar to the 1991 study’s conclusions, this study concluded that rail service is a long-term solution and recommended that bus service be expanded as a short-term strategy. In 1998, SMCTA sponsored another study, the *Dumbarton Corridor Transit Concept Plan* that identified the need for rail service and formulated a plan.

In 1999, SMCTA sponsored the *Dumbarton Rail Corridor Study* that defined a logical Rail Service Plan for the Dumbarton Rail Corridor. This information allowed Dumbarton Rail Service to be included as a candidate project in the transportation component of the Metropolitan Transportation Commission’s (MTC) *Blueprint for the 21st Century* (2000). The Blueprint lists the priorities for regional transportation projects with recommendations on funding for additional

resources beyond those committed in the Regional Transportation Plan (RTP). Funds are now programmed with the inclusion of the DRC in MTC's *Blueprint for the 21st Century*. The Blueprint reaffirmed the priority to address the dramatic increases in Bay Area population and traffic and other changes affecting transbay travel. The decision to proceed with these studies for the 20.5-mile Dumbarton Rail Corridor, which links Alameda and San Mateo counties, was well founded by both prior system-wide planning studies and by policy decisions. The DRC study area is shown in **Figure 1**.

Project Study Report

The PSR is an engineering report; the purpose of which is to document agreement on the project scope, schedule and estimated cost so that the project can be seriously considered for inclusion in a future capital improvement program. The process is intended to enable stakeholders to focus on relevant project issues and to provide decision-makers with the most pertinent and information for addressing transportation problems.

The purpose of the PSR is to evaluate a commuter rail alternative operating on the DRC between east and west bay destinations. The PSR included the following tasks:

- Define the study area, mobility issues, travel needs, and establish goals and objectives
- Perform engineering studies
- Develop a range of possible alternatives to address mobility issues and travel needs
- Perform preliminary environmental evaluation
- Prepare cost estimates
- Prepare a schedule

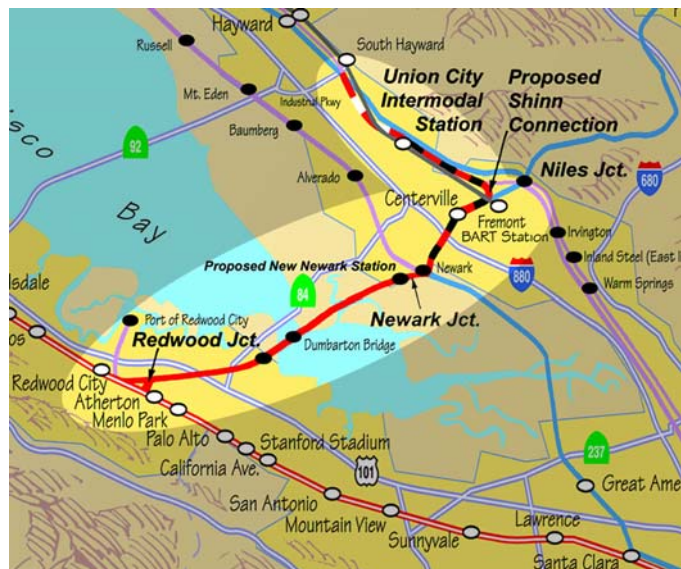


Figure 1: Dumbarton Rail Corridor

Project Definition and Location

The SMCTA, in partnership with the Alameda County Transportation Improvement Authority (ACTIA), Capitol Corridor, Silicon Valley Manufacturing Group, MTC, and the Santa Clara Valley Transportation Authority (VTA) is leading the study effort to enhance connectivity and increase efficiency of existing rail systems in San Mateo, Alameda, and Santa Clara Counties. The DRC project will initiate new cross-bay commuter rail service on an existing rail corridor between the Peninsula and the East Bay. Specifically, the DRC project will focus on new infrastructure and infrastructure rehabilitation between Redwood City in San Mateo County and Union City in Alameda County.

The DRC is located in the southern section of the Bay Area regional rail network. This 20.5-mile corridor begins at the former Southern Pacific Centerville rail line in Redwood City, San Mateo County. It crosses the Bay over the Dumbarton and Newark Slough Railroad Bridges to Union City in Alameda County, then continues north via a new connection to the Union Pacific

Railroad (UPRR) Oakland Subdivision rail corridor. Major highways intersecting the corridor include Interstate 880, State Highway 101, and State Highway 84. The corridor passes through communities characterized by businesses and pedestrian activity with on-going transit-oriented development.

Interagency Coordination

The Project Study Report has been developed with input from a wide variety of sources, including the Technical Advisory Committee (TAC) which met to review and provide comments at all stages in the development of the report. Membership of the TAC includes:

- Alameda County Congestion Management Agency (ACCMA)
- Alameda County Transportation Improvement Authority
- Bay Area Rapid Transit District (BART)
- Capitol Corridor
- City of Fremont
- City of Menlo Park
- City of Newark
- City of Union City
- Metropolitan Transportation Commission
- San Mateo County Transit District (representing Caltrain and SMCTA)
- Santa Clara Valley Transportation Authority
- Silicon Valley Manufacturing Group

In addition, numerous one-on-one meetings were held with the various stakeholders, including city representatives and concerned citizens. A Policy Advisory Committee (PAC) is being formed in April 2004 to further the project development.

Project Goals

- Utilize existing infrastructure to enhance regional connectivity between BART, AC Transit, ACE, Capitol Corridor and Union City Transit in Alameda County and Caltrain and SamTrans in San Mateo County.
- Improve access to public transit service and facilitate freight movement.
- Enhance operational efficiency by decreasing delays to existing passenger and freight systems such as ACE, Capitol Corridor, and UPRR.
- Alleviate severe traffic congestion on the existing Dumbarton Bridge and on intersecting highways.
- Improve regional air quality by reducing auto emissions.
- Accommodate future travel demands and improve mobility options to employment, education, retail and community centers.

Project Design Basis

Design standards set forth by Caltrain and UPRR will be used in preliminary engineering of the project. Caltrain design standards will be used for all DRC facilities on the existing or acquired SamTrans right-of-way and property and for facilities used exclusive by the DRC. UPRR design standards will be used on UPRR right-of-way where joint operations of Dumbarton and UPRR facilities occur, and the details of which will be determined by an agreement between the parties.

Key Findings of the Project Study Report

Overall findings of the PSR are that the DRC project will provide passenger service across the Bay, separate some passenger and freight rail movements, add additional passenger and freight capacity to the line, reduce delays, and make it possible to construct an intermodal station at Union City. The key findings for specific technical issues are summarized below:

- **Track Improvements** – DRC trackage will connect to the existing Caltrain corridor on the Peninsula at Redwood Junction, cross the San Francisco Bay via the Dumbarton Bridge, run through Newark and connect to existing tracks that run north to Union City. The track improvements will provide connections to ACE and Capitol Corridor trains in Fremont and Union City in the East Bay, in addition to Caltrain on the Peninsula.
- **Structures and Grade Separations** – A major component of the infrastructure improvements is the rehabilitation and reconstruction of major structures along the corridor, featuring the reconstruction of the marine bridges crossing the San Francisco Bay with a completely new Dumbarton moveable bridge as the centerpiece. The existing Newark Slough moveable bridge span is to be replaced and the Henderson Underpass is to be modified. New rail bridge structures at the Shinn Connection and across Alameda Creek will be constructed.
- **Stations** – There are four stations along the DRC, which include two existing stations in the Fremont Centerville District and Union City, and two new stations in Newark and Menlo Park/East Palo Alto. The existing Fremont-Centerville station will be upgraded and the existing Union City BART station will be reconstructed into an intermodal facility. The Union City Intermodal station will be constructed by others as a separate project.
- **Railroad Signals** – New railroad signals and a Centralized Traffic Control (CTC) system will be provided to control movements onto and through the Dumbarton Corridor. The corridor has substantial single-tracked sections that require carefully controlled train operations.
- **Railroad Operations** – The effect of the Dumbarton Corridor Project is to improve both passenger and freight coordination of train operations in the East Bay, as well as provide new commuter rail service, and potentially new freight service, over the Dumbarton Bridge.
- **Travel Demand Forecast** – The forecast travel demand for this project ranges from approximately 4,800 daily commuters in 2010, increasing to an estimated 6,900 commuters in 2025. Initial service levels will consist of six trains per day in each direction (six round trips). Six trains will originate in Union City in the morning peak and travel across the Bay to the Peninsula. Three of these trains will travel to the San Francisco Fourth and Townsend station and three will travel to the San Jose Diridon station. All six trains will return to the East Bay in the evening peak.

A sensitivity test was prepared to evaluate the potential demand for DRC service in the Livermore Valley. It was determined that ridership could be increased by almost 30 percent in 2010 (6,180 boardings) and 40 percent in 2025 (9,580 boardings) by extending DRC service to the Livermore Valley. The results of this sensitivity test indicate that additional study of extending DRC service should be investigated in the next phase of the study.

- **Environmental Analysis** – The preliminary environmental analysis of the project indicated a series of potential impacts that are normally associated with rail construction projects, including traffic and noise during construction and possible impacts on native wildlife species. These impacts will be studied further during the Environmental Study phase, but are expected to be mitigated within the project scope and budget.
- **Right-of-Way** – The majority of the right-of-way was previously purchased by SamTrans. Additional right-of-way acquisition is anticipated at station sites and in the East Bay for completing the Shinn (track) Connection and other portions of the project. UPRR right-of-way between Shinn Street in Fremont and Industrial Blvd may be purchased as part of this Project. Other right-of-way purchases may be required and will be examined in subsequent studies.
- **Costs Estimates** – The DRC capital costs were estimated at almost \$300 million. Capital costs include right-of-way acquisition, design, construction, and vehicle procurement. Annual 2010 operating and maintenance costs are estimated to be \$8 million.
- **Funding** – Regional Measure 2 (RM2) will be the primary source of revenue to fund capital, operations, and maintenance costs for the DRC project. The Measure will enact a long-term traffic congestion relief plan funded by a new \$1 toll increase on the seven state-owned Bay Area bridges.

Key Project Milestones

- **December 2001** – Project is included in the Bay Area Regional Transit Expansion Program (MTC Resolution 3434).
- **Spring 2002** – Conceptual Engineering is performed for the East Bay Segment and Dumbarton Bridge Crossing.
- **May 2003** – Project Study Report to further define the project description and refine cost estimates is conducted.
- **Summer 2003** – Separate Environmental Review Process is performed for the East Bay Segment and the Dumbarton Bridge Crossing.
- **March 2004** – Bay Area voters approve Regional Measure 2, which will provide funding for the DRC project.

Next Steps

With the approval of Regional Measure 2, funding will be available for capital, operating, and maintenance costs. As a result of early project development and environmental documentation already underway, train service on the East Bay segment between the cities of Union City and Fremont could be initiated in 2008 followed by train service on the Dumbarton Bridge Crossing between the cities of Newark and Menlo Park/Redwood City in 2010.

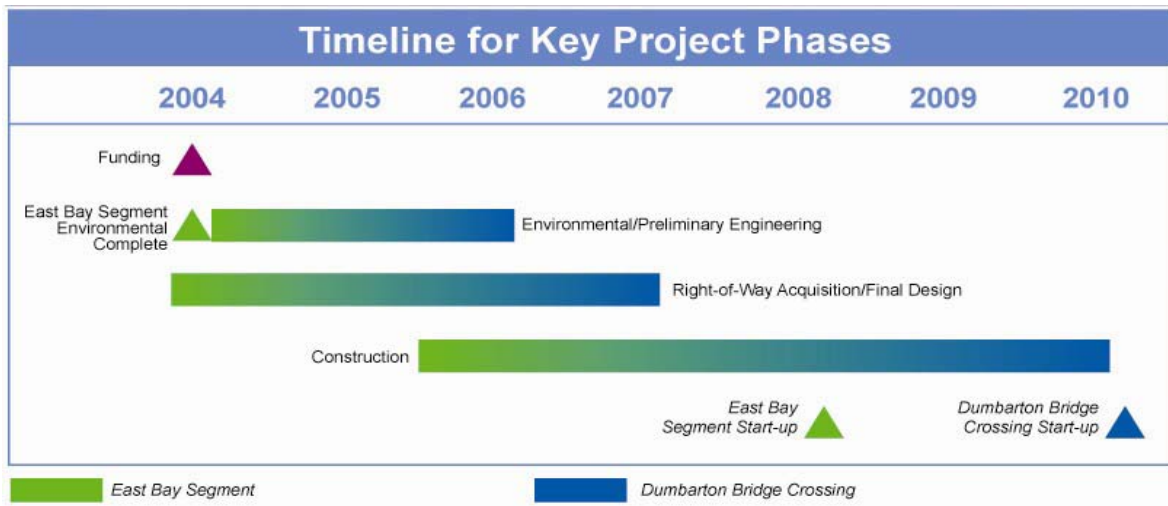


Figure 2: Timeline for Project Phases

TRACK IMPROVEMENTS

This section is a summary of the Project Study Report Appendix C – Track Improvements.

The track improvements for the Dumbarton Rail Corridor have been designed with the following objectives:

- Provide safe, reliable trackage for joint commuter and freight rail traffic
- Provide a layout of tracks and switches that gives flexibility and reliability to operate on schedule; and
- Separate freight and passenger services to the extent possible to eliminate or minimize delays and conflicts in train movements.

Considering the operating schedule, a majority of the track system can be designed for single track operations with additional sidings at stations, to permit passing operations, and to allow for temporary storage of disabled trains, if necessary.

The track improvements have been separated into seven segments. There are six segments (A, B, C, D, E and G) for the DRC and one segment (F) for the UPRR Connection over Alameda Creek at Niles Junction. Depending on the final ownership of rail right-of-way, the appropriate design standards will be used. For the purposes of this study it was assumed that Caltrain standards will be used segments A, B, and C, and UPRR standards will be used for segments D, E, F and G. See **Figure 3** for limits of the design and construction segments.

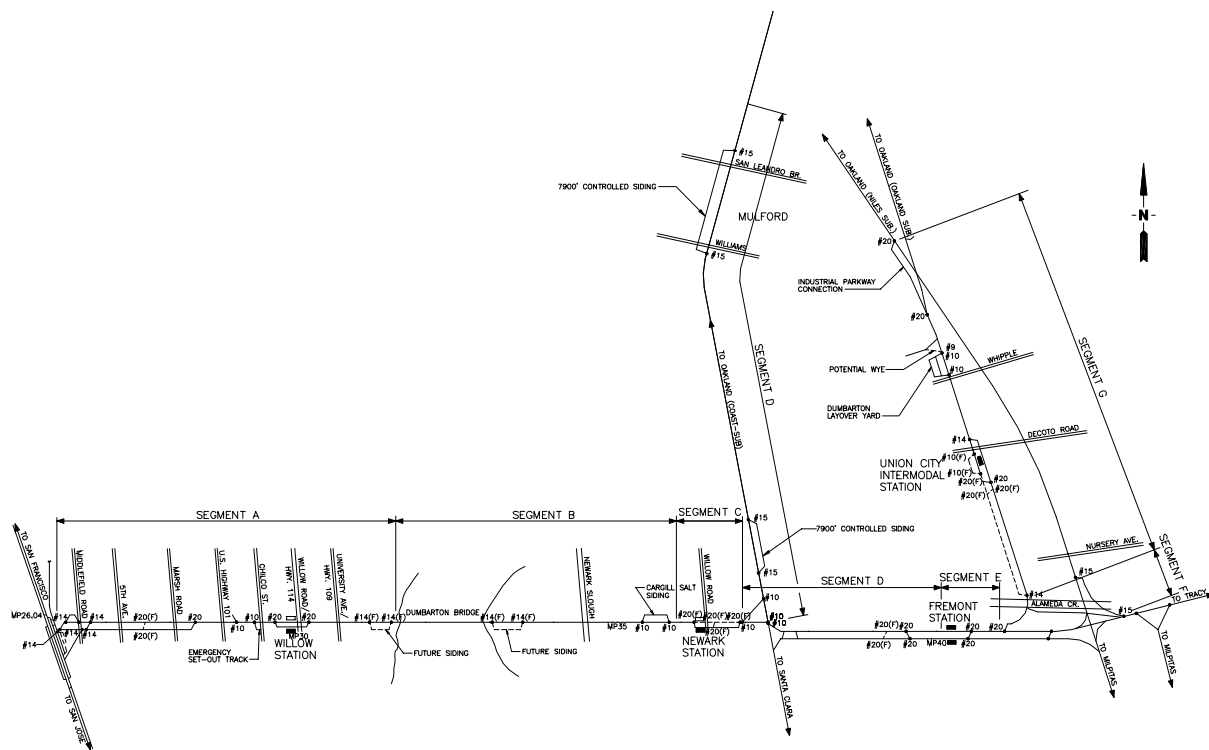


Figure 3: Dumbarton Rail Corridor Track Diagram

The track improvements are largely reconstructed on existing track alignment to the extent possible to minimize disturbance to the existing embankments and potential wetlands along the corridor in the East Bay. This includes locating sidings where previous sidings existed to minimize disturbance in sensitive areas.

Segment A – Redwood Junction to Dumbarton Bridge West Abutment (5.3 miles)

The rehabilitation of this segment of track is needed to replace old, obsolete, and worn rail components; to provide flexibility for passenger service operations; to reduce future maintenance expenditures; and to enhance ride quality and safety. The DRC connects to the existing Caltrain tracks in Redwood City at a location called Redwood Junction which is just south of where the Woodside Overhead crosses over the Caltrain tracks. Starting at this location, one of the two existing tracks of the DRC will be replaced with a new single track system with Centralized Traffic Control. The other existing track will be left in place as a two-mile long siding to a point west of US Highway 101 (Henderson Underpass). From there, the mainline will be single-tracked to the end of Segment A at the Dumbarton Bridge except for a controlled siding at the proposed Willow Road station site in Menlo Park/East Palo Alto. A new North Wye siding will be provided near Redwood Junction just west of Middlefield Road.

There are existing surface street/railroad at-grade crossings in this segment. They include:

- Middlefield Road
- Driveway entrance to Middlefield warehouses
- 2nd Avenue
- 5th Avenue
- Marsh Road
- Chilco Street – This is planned to be closed by others, with a new grade crossing proposed about 1000 feet west in lieu of Chilco Street.
- Willow Road
- State Highway 109 – University Avenue

An existing grade separation is located at US Highway 101 (Henderson Underpass).

Segment B – Dumbarton Bridge (4.5 miles)

The rehabilitation of this segment of track is needed; to replace old, obsolete, and worn rail components; to provide flexibility for passenger service operations; to reduce future maintenance expenditures; and to enhance ride quality and safety. This segment includes the Dumbarton Bridge Crossing, the bridge over Newark Slough, and the industrial siding to serve the Cargill Salt Plant. The mainline for this segment will be single-tracked for its entire length except for two sidings – one future siding and the Cargill Salt Plant industrial siding. The 1400-foot long future siding is shown just east of the Dumbarton Bridge. At present this is a stub-ended track which will be used as a base for the future siding. The main track will be constructed around the existing salt loading facility track located at Control Point (CP) Salt Plant with the existing track acting as the siding. There are no at-grade crossings in this segment.

Segment C – Hickory Street to Elm Street, Newark (1.07 miles)

The rehabilitation of this segment of track is needed; to replace old, obsolete, and worn rail components; to provide flexibility for passenger service operations; to reduce future maintenance expenditures; and to enhance ride quality and safety. This segment is a single track mainline. A new station called Newark Station is to be located just west of Willow Street.

The outboard Newark Station, with a side platform on the south side, will be designed for a future second main track. The future second main track centers will be a minimum of 18 feet apart and will allow safe pedestrian access from Willow Street to the outside platform.

There are two grade crossings in this segment:

- Willow Street
- Spruce Street

Segment D – Elm Street, Newark to Maple Street, Fremont (2.83 miles) and UPRR Coast Line Sidings at Mulford and Jarvis Road

The rehabilitation of this segment of track is needed to provide flexibility for passenger service and freight service operations and to enhance ride quality and safety. This segment is owned by the UPRR and will be designed to their standards depending on the trackage rights agreement with the UPRR. Overall, the proposed project provides new freight connections and sidings to allow diversion of freight traffic from the Centerville rail corridor to other UPRR rail corridors. The mainline is a single track through Newark Junction and double-tracked once it crosses Sycamore Street. The project will upgrade the existing most northerly track of the double-track section. Two controlled sidings are proposed on the UPRR rail corridor between Newark and Shinn Junctions to accommodate ACE, Capitol Corridor, and Dumbarton passenger traffic.

There are numerous existing surface street grade crossings in this segment including:

- Ash Street
- Carter Avenue
- Sycamore Street
- Cherry Street, and
- Cedar Boulevard in the City of Newark;
- Blacow Road, and
- Dusterberry Way in the City of Fremont

Existing grade separations are located at:

- Newark Boulevard in Newark
- I-880 in Fremont

Segment E – Maple Street to Riverwalk Drive, Fremont (1.2 miles)

The rehabilitation of this segment of track is needed to provide flexibility for passenger service operations and to enhance ride quality and safety. This is an existing double track section for the UPRR. The existing southerly track on the right-of-way will accommodate a side platform station arrangement at the existing Fremont Centerville station. Overall, the proposed project provides new freight connections and sidings to allow diversion of freight traffic from the Centerville rail corridor to other UPRR rail corridors. This track improvement will allow increased level of passenger use at the Centerville station. The tracks may need to be redesigned at the Fremont Centerville station to ease passenger ingress and egress to the cars and reduce the potential train door operation problems for the passenger trains.

There are two existing surface street crossings in this segment:

- Maple Street and
- Fremont Boulevard

An existing grade separation is located at Paseo Padre Parkway.

Segment F – Niles Junction Connection Track

This track connection is required to reroute a portion of the UPRR freight traffic that currently travels between the Centerville segment of the Niles Subdivision and the Oakland Subdivision. This new connection will reduce the amount of freight traffic traveling through the Fremont Centerville station. The new track starts just south of the existing grade separation over Niles Boulevard and diverts to the east from the existing Niles Subdivision mainline track, crosses the Alameda Creek Flood Control Channel, passes to the north of the new pump station at Mission Boulevard, passes over the Mission Boulevard and connects to the Oakland Subdivision mainline track. The connecting track is designed to meet UPRR mainline track standards.

Segment G – Riverwalk Drive, Fremont to Industrial Boulevard, Hayward (5.8 miles)

The rehabilitation of this segment of track is needed to replace old, obsolete, and worn rail components; to provide flexibility for passenger service operations; to reduce future maintenance expenditures; to enhance ride quality and safety; and to provide a track connection to access the new Union City Station. This segment is the Union City portion of the DRC and will initially serve the Capitol Corridor service to the Union City Intermodal Station. This line segment begins adjacent to the Riverwalk community in Fremont where the track diverges from the Niles Subdivision. It parallels the existing tracks before turning to the north, going under the existing BART embankment (a new structure), and connecting to the existing UPRR Oakland Subdivision tracks just south of the existing bridge over the Alameda Creek Flood Control Channel. This new track will require additional right-of-way from the Riverwalk Homeowners Association on the west side of the BART embankment and from the industrial property on the east side of the embankment to the Flood Control Channel. The track connection to the existing Shinn Yard area will have to be adjusted to allow for the new Shinn junction. The mainline continues across the existing single-track bridge over the Flood Control Channel. The track is designed for a future double-track configuration from just north of the Channel to the Union City Intermodal Station. The future second track will be added on west side of the existing track away from the existing homes toward the east. Just south of the Union City Intermodal Station a one-mile segment of second track will be constructed.

Track Spacing: At the Union City Intermodal Station, the track spacing varies from 40 feet at the pedestrian underpass to 18 feet about 1000 feet north of the pedestrian underpass. The existing trackbed will be raised through the station area to allow for a common concourse access below the tracks with the BART station expansion. The profile of the track will be raised approximately 10 feet from the PSSC property site to the south of Decoto Road. The track configuration at the Intermodal Station is a center platform layout with a future third track serving as a bypass track and/or a second platform track for a side platform with the potential to serve as a direct platform-to-platform connection to BART.

Double Tracking at Decoto Road: The tracks will cross Decoto Road in a double track configuration to just south of I Street where the line will continue as a single track to the Industrial Junction connection to the Niles Subdivision in the City of Hayward. Decoto Road will need to be raised about two feet to accommodate the new profile. The single track will replace

the existing in the same location. Special reviews will be conducted in the Decoto neighborhood to try to increase the pedestrian safety in the rail corridor.

New Layover Yard: A new layover yard for the Dumbarton Rail service will be required in the East Bay to store trains overnight and stage the morning start-up of revenue service. The layover yard is configured to store six trains, 500 feet long, on two layover tracks. The tracks will be designed in a through configuration for full access and connected to the Carpenter Industrial Yard. The layover yard will lie within the 80-foot wide railroad corridor. A wye track will also be constructed at the north end of the yard to allow for the turning of trains.

Industrial Parkway Connection: North of the Carpenter Industrial Yard two alternatives have been developed for the track connection to the UPRR Niles Subdivision referred to as the Industrial Parkway connection:

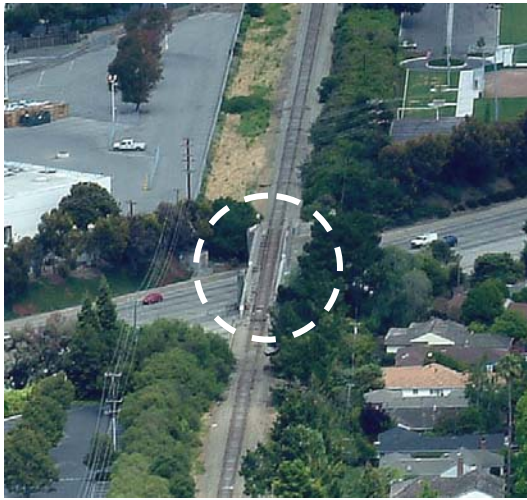
1. Track design for passenger use only, designed with a two (2) percent momentum grade with vertical curves designed to AREMA standards.
2. Track design per UPRR mainline criteria, designed with a one (1) percent ruling grade.

Alternative 1 does not require the relocation of the access structure and road to the BART Hayward Yard and is designed for passenger train use only. It uses AREMA design criteria for vertical curves not the UPRR mainline criteria.

Alternative 2 allows full UPRR access but requires two new bridge structures and a new access road to the BART maintenance facility. The access road will most likely also require a pump station for storm drainage. This is designed to UPRR mainline standards. Since very limited freight service through the Industrial Parkway Connection is projected in the future, Alternative 2 with its flatter grade is probably not required. This alternative is considerably more costly than Alternative 1.

Both alternatives connect to the existing Niles Subdivision mainline tracks just south of Industrial Parkway. The existing Niles track is a single track line at this location; however the connection is designed to accommodate a future double track connection to the Niles Subdivision.

Henderson Underpass



The Henderson Underpass is a single track, steel plate through girder railroad bridge constructed over US 101 in two stages – when US 101 was first constructed in 1931, and then when it was widened in 1956. A further widening of US 101 that is under consideration by Caltrans would require the Henderson Underpass to be replaced with two longer, single span bridges, which is not part of this project. At a minimum, it is proposed to rehabilitate the deck structure converting the open deck structure to a ballasted deck structure, to improve the ride characteristics for commuters. This involves raising the rail profile slightly to provide room for ballast and ties.

Figure 5: Henderson Underpass

Dumbarton Bridge

The Dumbarton Bridge crosses the San Francisco Bay, south of the Dumbarton Route 84 Highway Bridge. The main elements of the bridge are conventional railroad trestle approaches leading to steel girders, steel trusses and a swing bridge in the deepest portion of the crossing.



Figure 6: Main Elements of the Existing Dumbarton Bridge

The western approaches include concrete bent structures that require upgrading for seismic retrofit requirements, while the timber approach sections need to be completely replaced. The main swing bridge span is not operational and will need to be replaced. The proposed replacement bridge type is a rolling lift bridge shown in **Figure 7**, which will be more economical than the existing swing type bridge. The lift bridge will be remotely operated from the Caltrain operations center or locally operated from an Operator's House where the operator can monitor the approach and clearance of rail and ship traffic. Train signals will be interlocked with the lift bridge for safe train operations. Because minimal marine traffic passes through the moveable bridge channel, it is anticipated that the bridge will be kept primarily in the closed position and opened upon five-hour advanced notice.

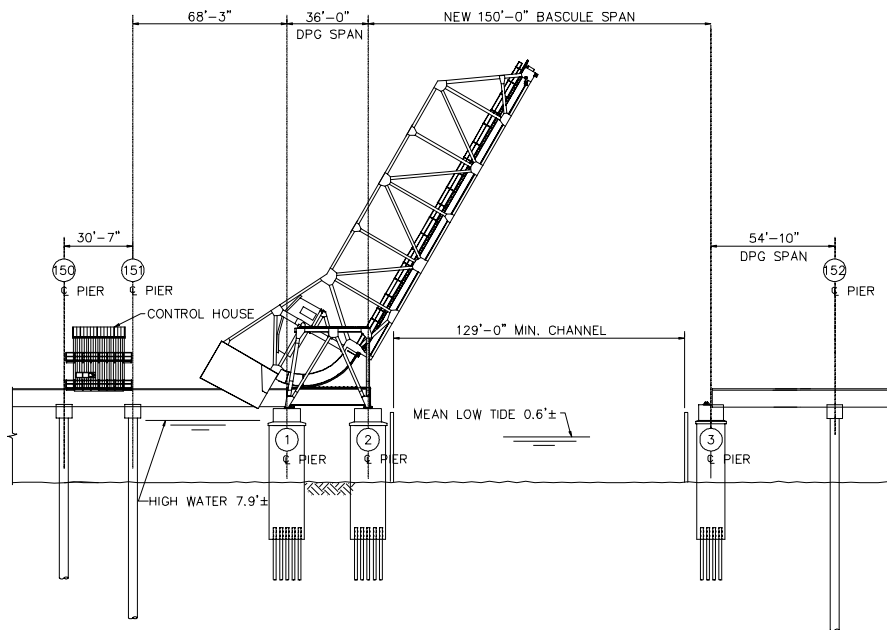


Figure 7: Proposed Replacement Structure for Dumbarton Bridge

Newark Slough Bridge

The existing Newark Slough Swing Bridge is deteriorated due to lack of use and maintenance, and will be replaced with a less complex steel girder swing span. This span will be normally closed to marine traffic and opened by local operation, following an advance request from marine traffic. A mechanic/operator will be mobilized to the site to operate the systems to lift and pivot the swing span. The timber trestle approaches to the swing span will be replaced with modern concrete bents and girders.



Figure 8: Existing Newark Slough Swing Bridge

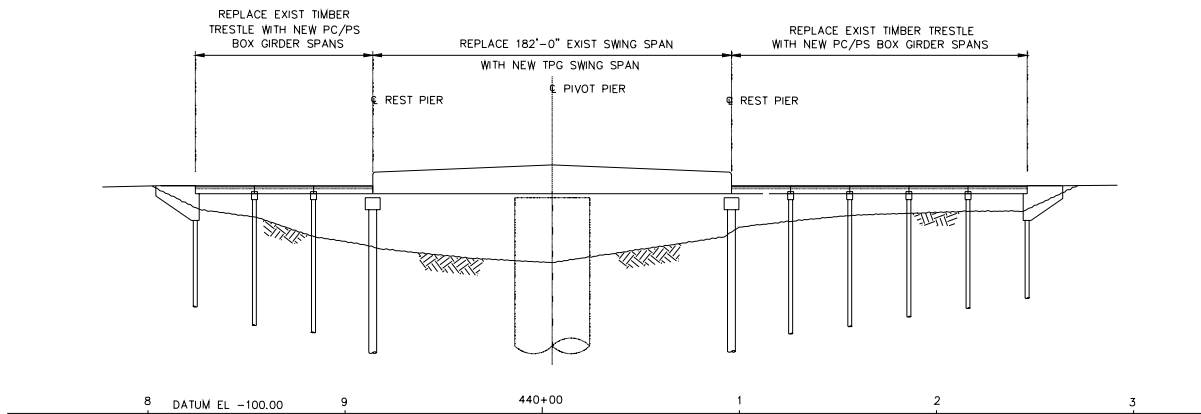


Figure 9: Proposed Replacement Structure for Newark Slough

BART Underpass at Shinn Connection

The Shinn Connection from Union City to the Centerville Line will allow for direct commuter rail connections from the north to the west. The proposed alignment of the DRC at the Shinn Connection in the City of Fremont is indicated in **Figure 10**. It shows a connection to the north running underneath the elevated BART tracks. A new structure for BART is proposed to provide clearance for the DRC to pass underneath.



Figure 10: Proposed Shinn Connection underneath BART Tracks

Alameda Creek Bridge

A new fourteen span bridge is proposed to carry freight rail traffic coming from the north to the east across Alameda Creek and Mission Boulevard in the City of Fremont as shown in **Figure 11**. This connection will help reduce freight traffic on the Centerville portion of the Oakland Subdivision, and will reduce conflicts between DRC passenger trains and freight operations.



Figure 11: Alameda Creek Bridge Alignment

Grade Separation to access the existing BART entrance on the west. In a separate phase the east side of the BART concourse would be opened to create direct access from the BART concourse to the Rail Station Concourse.

Fremont Centerville Station

The proposed redeveloped Fremont Centerville station is located in the historic district of Centerville in the City of Fremont. It currently serves the Altamont Commuter Express (ACE) and Capitol Corridor lines. Freight operators also use this right-of-way. Because the site is within a developed urban setting and is used by several rail operators, there will be more complex construction issues than at other Dumbarton line stations.

Options for modified station and platform configurations were evaluated but were not included due to financial considerations. Funding provisions for a center platform configuration are not available in the Project Funding plan, and it is assumed that these funds will have to be provided by other sources. Although design options do not preclude the opportunity for a future center platform or other improvements, it should be noted that the UPRR has indicated they would not permit a center platform configuration due to safety considerations and that this issue will require further discussions and negotiation with the UPRR.

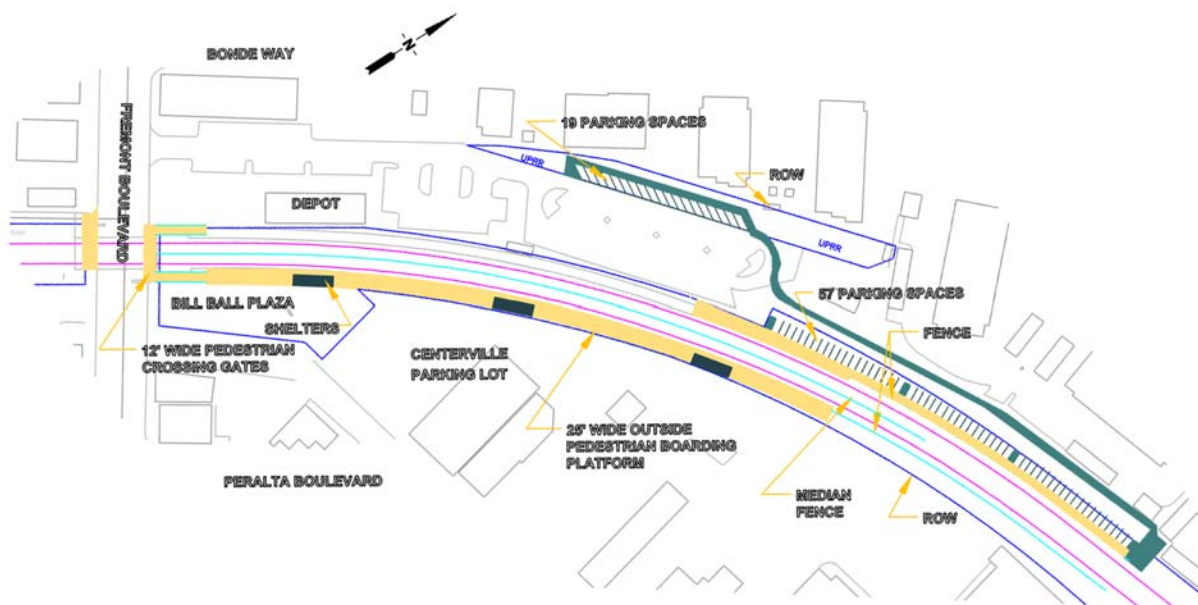


Figure 14: Upgraded Fremont Centerville Station

The existing Centerville station defines the character of future redevelopment. The station's historic character will be preserved to the greatest extent possible, and new improvements should fit within the current theme with compatible furnishings and finishes.

In 2010 it is estimated that about 410 riders will board the train per day at Fremont Centerville station. The majority of these passengers will be boarding the train in the morning peak for points west. The existing platform on the south side of the tracks will be replaced to meet

current design standards. In addition to the existing parking supply, 76 new parking spaces will be provided north of the tracks at the east side of the station.

Newark Station

The proposed Newark Station site is located south of Thornton Avenue just west of Willow Street. The new station would serve the existing single-family residential neighborhood concentrated mostly east of Willow Street, the business and manufacturing center north of the site, and the proposed redevelopment area to the south. The site is within walking distance to nearby existing and proposed employment centers and within commuter bicycle distance to residential neighborhoods.

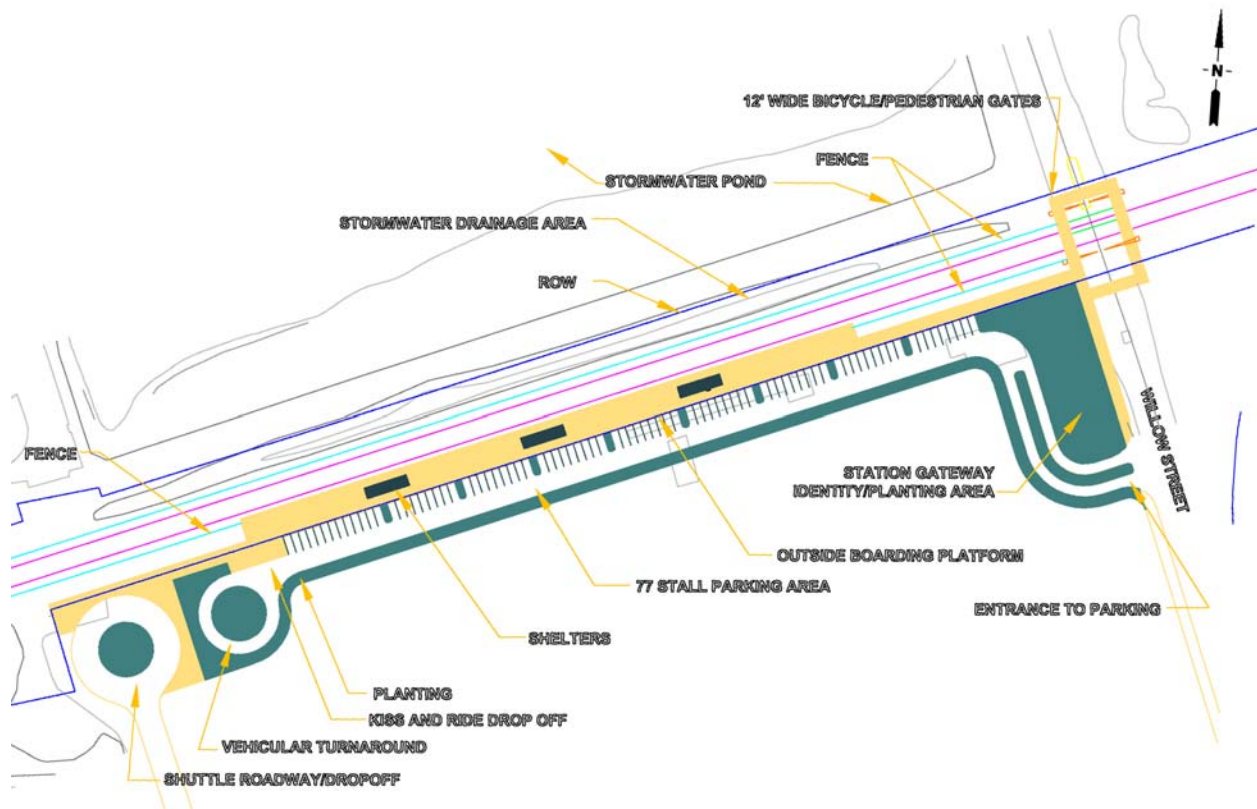


Figure 15: Site Plan of Proposed Newark Station

The station area is zoned Special Industrial and future local redevelopment uses are anticipated to be low density. Because of this it is expected that most patrons will access the station by personal vehicle, bicycle or transit. A signalized grade crossing at Willow Street will remain and will be improved to provide a widened at-grade pedestrian and bicycle crossing. No fatal flaw constraints to development have been identified during preliminary feasibility analysis.

In 2010, it is estimated that about 590 riders will board the train per day at Newark Station. The majority of these passengers will be boarding the train in the morning peak for points west. One side platform and 77 parking spaces are planned on the south side of the tracks.

Willow Road Station in Menlo Park/East Palo Alto

The proposed new Willow Road Station is sited in the Belle Haven neighborhood of the City of Menlo Park. The station site is located near the west end of the Dumbarton Bridge, south of the Bayfront Expressway (Highway 84) and west of the signalized grade crossing at Willow Road. This crossing will remain and will be improved to provide a widened at-grade pedestrian and bicycle crossing.

The new Willow Road Station will serve the existing single-family residential neighborhood concentrated south of the station, the manufacturing and commercial district along Hamilton Avenue, and nearby large employment centers along the Bayfront Expressway. The site is well-situated, centered within these land uses, and is within convenient walking distance of resident and employment populations.

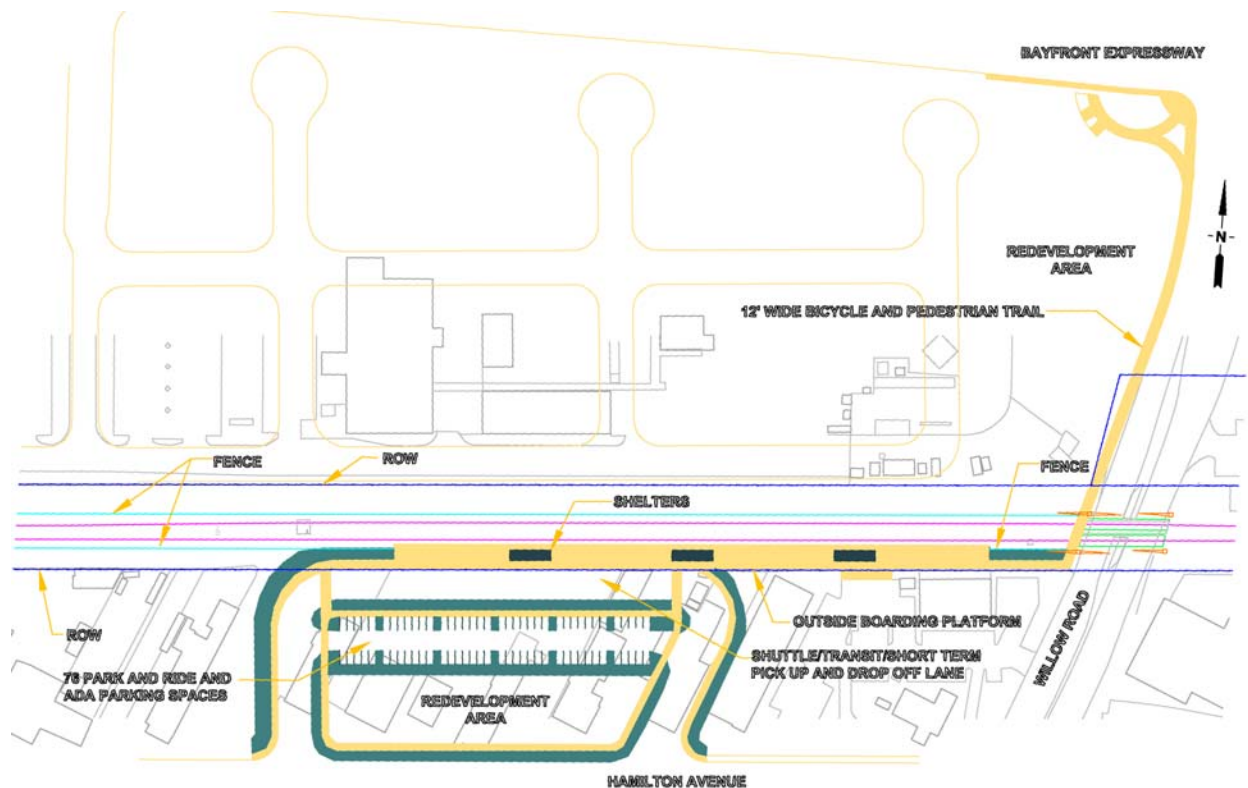


Figure 16: Site Plan of Proposed Willow Road Station

The site is developable with no evidence of major constructability issues. The topography is flat and easily graded to construct platform and parking lot improvements. No fatal flaw constraints to development have been identified during preliminary feasibility analysis.

In 2010, it is estimated that about 630 riders will board the train per day at Willow Road Station. One side platform and 77 parking spaces are planned on the south side of the tracks.

RAILROAD SIGNALS

This section is a summary of the Project Study Report Appendix F – Railroad Signals.

General Requirements

The signal system to be installed on the Dumbarton Line is dictated by the operational requirements and track design. At a minimum, interlockings are required at each end of the passing sidings. However, for operational flexibility some double track segments are extended to facilitate local freight operations and will require double track universal interlockings. Since the line is primarily a passenger operation, the wayside signals which compose the train control system, will be spaced per Caltrain standards. The Caltrain Signal System Design Standard is for 79 mph passenger trains, and 50 mph 100 Tons Per Operative Brake (100TPOB) freight trains. This is a nominal 4000 feet between wayside signals. Control Points will be installed where power switches are installed, and on both sides of the drawbridge. Once the Control Points are located, where the distance between signals governing movements in the same direction exceeds 5000 feet, consideration will be given to installing intermediate signals. Where industrial tracks enter the main track, either a signal or an electric lock is required.

Modifications to Control Point Configuration

The Caltrain Standard for a Control Point (CP) Configuration is to provide for a Main Signal house at a CP where four tracks merge into two tracks. An additional house is added for a full Control Point. This Main and Remote house configuration has the capability of handling a four-track universal crossover location. Additional equipment is added to the house as required by future projects. This approach allows conversion of CP Center into a two track universal crossover with just the addition of the additional switch machines, and necessary program modifications and testing. This “generic universal” approach allows the agency to procure long lead time equipment in advance of a project, and the specialized application is defined with the project, thus gaining economy and efficiency. Since the Dumbarton line is a single track line with passing sidings, a new smaller generic CP will be designed with the ability to expand to a two track universal crossover. The generic two track intermediate signal shelter will be suitable for the intermediate signal shelters.

Major Elements of Signal Work

In order to re-signal the Dumbarton Line the following major elements of signal work must be performed:

- New interlocked power switch machine connections will be required in the Redwood City Area into the Caltrain tracks at CP Dumbarton and CP Junction. Existing Control Points will be modified and expanded.
- A new movable bridge control system and signal system will be required.
- An either operating direction, a new wayside signal system will be required between Redwood City and the connection with the UPRR in Newark.
- Grade Crossing Warning Systems will need to be replaced. This includes the control system as well as the warning devices.
- Wayside Signal System Improvements on the UPRR.

RAILROAD OPERATIONS

This section is a summary of the Project Study Report Appendix G – Railroad Operations.

Dumbarton Rail Corridor

The Dumbarton service plan calls for six trains in the morning to deadhead from a layover yard to Union City, load passengers, and then travel along the Oakland Subdivision, Shinn Connection, Centerville line and the north leg of Newark Junction, cross over the UPRR Coast line, entering the Dumbarton Corridor via the south leg of CP Carter. Three of these trains are scheduled to travel north to the San Francisco Fourth and Townsend station and three trains will travel south to the San Jose Diridon Station.

All six trains stop at the Union City Intermodal Station, Fremont Centerville Station, Newark Station and Willow Road Station at Menlo Park/East Palo Alto on the DRC. Northbound trains on the Caltrain mainline stop at Redwood City, Hillsdale, San Mateo, Millbrae, South San Francisco and San Francisco. Southbound trains on the Caltrain mainline stop at Menlo Park, Palo Alto, California Avenue, Mountain View and San Jose. The schedules have also been developed so that, as much as possible, each train meets with either a Capitol Corridor (when the train is continuing on to Livermore/Tracy) or ACE (when the train is continuing on to Union City) train at Fremont/Centerville.

Other Railroad Operations

UPRR Service

The UPRR service assumes that the existing service of a three day-a-week local from Warm Springs to Union City continues. The Dumbarton UPRR service assumes that the existing service of a three day-a-week local working west from Newark and east from Redwood Junction continues. These locals do not cross the bridge. In addition, freight traffic for the Caltrain Corridor continues to be handled at the UPRR Newhall Yard, and not over the Dumbarton Corridor.

Amtrak Intercity Service

Amtrak Intercity operates one train a day in each direction along the UPRR Coast Subdivision, the “Coast Starlight”. The RTC model assumes that this train operates in the same manner as a UPRR through freight, with no stops between San Jose and Oakland. The train is scheduled to operate outside of the peak periods, and has no effect on the performance of the Dumbarton trains. For the purposes of train counts in this study, the Starlight is considered to be a UPRR train.

Altamont Commuter Express and Capitol Corridor Services

In addition to the UPRR, the Dumbarton Rail Service will share tracks with the ACE, a weekday peak period service between the Shinn Connection and Newark Junction. Additional daily passenger service is provided by the Capitol Corridor between the Hayward Layover facility, Union City, and Newark Junction. On the west side of the bay, the Dumbarton Service will operate over the tracks of the Caltrain commuter service between San Jose and San Francisco.

Maintenance and Storage Facilities

The operations analysis assumed that the Dumbarton trains would be stored at a new light maintenance facility in the East Bay. This location would provide cleaning, light running maintenance and overnight storage for five trainsets. All other servicing (fueling, inspections, heavy repair, watering) would be performed at existing Caltrain facilities on the Peninsula.

Findings of Operations Simulations

The Dumbarton improvements separate freight and passenger operations in the study area, providing benefits to all rail operators.

The Operations Analysis for the DRC studied the rail network in the Caltrain/ Newark/ Niles/ Fremont area as a network, instead of as a series of discrete routes. The operating simulations were performed using Berkley Software's "Rail Traffic Controller/RTC" program, the same program that is used by UPRR and Amtrak to determine system capacity. The rail network model of the area developed for the Northern California Rail Advisory Planning Group (NOCRAP) was utilized for the study, with the Dumbarton Improvements listed below added. The number of trains operated and engineering assumptions (track speeds, curvature, grades, turnout length etc.) in the model have been reviewed and approved by UPRR, CCJPA, ACE, and Caltrain.

The results from the RTC simulations showed that the rail operations in the East Bay improved significantly with the Dumbarton improvements. The number of UPRR train miles operated decreased, primarily due to the ability to route trains along the Niles Subdivision to the Central Valley via the Niles Bridge, instead of traveling west on the Coast line, then backtracking over the Centerville line to enter the canyon. The proposed sidings on the Coast Subdivision allowed UPRR and Amtrak Intercity trains to move more expeditiously, and permits local trains¹ to work the yard at Mulford without occupying the mainline, avoiding delays to through trains. The connections at Industrial Parkway and Shinn allows for the re-routing of the Capitol Corridor passenger trains away from the tight turns and slow running at Niles Junction.

The Existing case service pattern assumes that UPRR operate four trains a day over Altamont Pass and five trains daily along the Coast Line. The 2010 service patterns assume the same number of Altamont Pass trains, with an increase of four trains along the Coast route. Local trains operate from Warm Springs to Union City three to four days a week, and from Newark to West Newark and Mulford three to four days a week. The 2010 service patterns for the locals are assumed to remain the same. The Warm Springs-Roseville hauler operates via the Centerville line in the Existing case, so that it may work the Mulford Yard if necessary. This work is re-assigned to the San Jose-Roseville hauler in the Capitol Corridor and Base cases. Under normal circumstances, the Centerville line is not used by freights in the Base case, once the Dumbarton improvements are installed.

Operating Speeds

The track across the Dumbarton Bridge and approaches is upgraded to a maximum of 79 mph for passenger, 50 mph for freight. The 15 mph passenger and 10 mph freight curve restrictions

¹ "Local" trains are trains that place cars directly at customer's docks. "Manifest" or "Through" trains move larger groups of cars between cities.

at Newark Junction and Niles Junction remain in place, as does the 25 mph restriction on the south leg of the Redwood Junction wye.

Travel Times

- Travel time from Union City to San Francisco, with the train stopping at Redwood City, Hillsdale, San Mateo, Millbrae, South San Francisco then expressing to San Francisco, is sixty-six minutes (1:06).
- Travel time from Livermore to San Francisco, with the train stopping at Redwood City, Hillsdale, San Mateo, Millbrae, South San Francisco then expressing to San Francisco, is eighty eight-minutes (1:28).
- Travel time from Union City to San Jose, with the train stopping at Menlo Park, Palo Alto, California Avenue, Mountain View and expressing to San Jose is fifty-four (0:54) minutes.
- Travel time from Livermore to San Jose, with the train stopping at Menlo Park, Palo Alto, California Avenue, Mountain View and expressing to San Jose is seventy-six (1:16) minutes.

Schedules

The schedules have been developed to test the capacity of the line, and provide a basis for the ridership estimates. The service pattern is for the trains to start at Union City, cross the Dumbarton Corridor, and then half of the trains are scheduled to travel north to Millbrae and South San Francisco, then continuing onto San Francisco, and the other half traveling south to San Jose. Based on the preliminary ridership figures, the schedules tested are “limited stop” schedules. All trains stop at Union City Intermodal Station, Fremont Centerville Station, Newark Station, and Willow Road Station at Menlo Park/East Palo Alto on the DRC. Northbound trains stop at Redwood City, Hillsdale, San Mateo, Millbrae, South San Francisco and San Francisco. Southbound, the trains stop at Menlo Park, Palo Alto, California Avenue, Mountain View and San Jose. The schedules have also been developed so that, as much as possible, each train meets with either a Capitol Corridor (when the train is continuing on to Livermore/Tracy) or ACE (when the train is continuing on to Union City) train at Fremont/Centerville. Please refer to the attached Conceptual Schedules.

Performance Benefits

The results of the RTC modeling indicate that UPRR and Capitol Corridor will benefit from the construction of the Dumbarton improvements. The improvements allow for the operation of the Dumbarton service without impacting either ACE or Amtrak Intercity services. The Dumbarton Improvements provide the dispatchers with a number of new opportunities to avoid congestion on the Coast Subdivision, the Centerville Line and Niles Junction. The key benefits for each operator are:

- UPRR: A reduction in over-all train miles operated and an estimated 30% reduction in delays from the existing conditions.
- Capitol Corridor: A reduction in over-all train miles operated and an estimated 50 percent reduction in delays from the Capitol Corridor improvement conditions.
- ACE: Ability to operate higher frequencies without an increase in delays.
- Amtrak Intercity: Less congestion on the Coast Subdivision provides greater reliability in the study area.

Train Counts

The construction of the Dumbarton Improvements will result in a shifting of the service patterns in the East Bay rail network. The overall number of trains will be increasing, yet some segments will see a reduction in the average number of trains weekly. The following table depicts the expected shifting of the number of trains on a weekly average between segments. The table shows the estimated weekly average number of trains, not a daily average, for the following reasons:

- Through freight traffic tends to be heavier on weekdays.
- ACE and the Dumbarton trains only operate during the weekdays.
- Local freight operating patterns vary greatly over the course of a week.
- Congestion may force a train to an alternative route once or twice a week.

Table 1: Estimated Number of Trains per Week in Rail Corridor

Service	Existing	Future
Caltrain (Dumbarton)	0	60
Union Pacific	32	12
Capitol Corridor	54	154
Altamont Commuter Express	30	40

TRAVEL DEMAND FORECAST

This section is a summary of the Project Study Report Appendix H – Travel Demand Forecast.

A travel demand forecast model was used to estimate the ridership for the Dumbarton Rail Corridor project. The model chosen for the DRC was the VTA regional model, which is an enhanced version of the MTC regional model. A technical memorandum, which includes details on methodology and model results, can be found in the PSR. The technical memorandum includes information on the following evaluation measures:

- New transit trips,
- Daily boardings by major transit operators in the corridor,
- Daily passenger-miles and passenger-hours of service for the project alternatives,
- Daily station boardings,
- Daily station boardings by mode-of-access and egress,
- Daily station park-and-ride demand,
- Travel times by auto and transit modes for key origin-destination pairs,
- FTA transit user hours of benefit,
- Fare revenue, and
- Peak hour highway vehicle-miles and vehicle-hours of travel.

A No-Project alternative and two build alternatives (years 2010 and 2025) were modeled:

Alternative 1.0: 2010 and 2025 Baseline Service Alternatives, representing minimum rail infrastructure improvements and peak period directional service only (6 trains in the peak), all originating from the proposed Union City Intermodal Station. Three peak trains would serve the northbound direction to San Francisco and three peak trains would serve the southbound direction to San Jose/Diridon.

Alternative 1.1: 2010 and 2025 Baseline Service Alternatives (6 trains in the peak) with Livermore service options and Union City service options. One of the three trains going northbound to San Francisco would originate in Livermore, and one of the three trains going southbound to San Jose/Diridon would originate in Livermore. This alternative was developed as a sensitivity test of the potential demand for DRC service in the Livermore Valley. It should be noted that operational and physical improvements, or the costs to implement and operate this service was not considered in the PSR. The results of this analysis will determine if an additional study to extend the DRC into the Livermore Valley should be explored.

Each of the build alternatives were coded based on segment speed information, station locations, train schedules and background feeder bus operating plans provided by project team members. All proposed stations assumed the availability of park-and-ride lots. With the exception of Willow Road station, no new free shuttle services were provided at the new stations. Existing AC Transit local bus routes near the proposed stations were routed to connect with the Dumbarton trains. At Willow Road in San Mateo County, a free shuttle bus was included in the networks to serve the large employment sites located to the west of the station. Each of the project alternatives included the continued operation of the Dumbarton Express bus service at year 2000 service levels in addition to the Dumbarton Rail service.

The following table shows patronage estimates at the station level for each build alternative:

Table 2: Projected Daily Station Boardings

Alternative 1.0	Union City --> San Francisco/San Jose	
	2010	2025
Station	Boardings	Boardings
Union City	957	1,458
Fremont	408	892
Newark	588	813
Willow Road	626	764
Redwood City	458	900
Hillsdale	302	584
San Mateo	93	203
Millbrae	86	160
South San Francisco	87	129
San Francisco	263	56
Menlo Park	112	164
Palo Alto	563	552
California Avenue	77	62
Mountain View	111	89
San Jose/Diridon	65	81
ALL	4,796	6,907
Alternative 1.1	Union City/Livermore --> San Francisco/San Jose	
	2010	2025
Station	Boardings	Boardings
Livermore	417	681
Pleasanton	464	989
Union City	936	1,345
Fremont	286	806
Newark	594	897
Willow Road	668	843
Redwood City	588	1,100
Hillsdale	395	755
San Mateo	133	311
Millbrae	106	204
South San Francisco	99	167
San Francisco	272	64
Menlo Park	134	226
Palo Alto	762	865
California Avenue	113	109
Mountain View	145	137
San Jose/Diridon	65	84
ALL	6,177	9,583

Note: The model assumes a transfer wait time equal to one-half the headway of the route being transferred to, capped at a 15 minute maximum. So trips transferring from BART to the DRC (or transferring from any other mode to DRC at any other station) would have a transfer wait of 15 minutes.

ENVIRONMENTAL ANALYSIS

This section is a summary of the Project Study Report Appendix I – Environmental Scan.

The purpose of preliminary environmental analysis (also referred to as environmental scan) is to identify environmentally sensitive resources, areas, and issues at an early, conceptual stage of the project, so that sensitive resources and areas can be avoided to the extent that is possible during project design. Early identification of environmental issues can also assist in determining the types of environmental analyses, documents, regulatory oversight and permitting that will be required by the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), and other environmental laws to implement the project. The full environmental scan report, included in the DRC PSR, provides a summary description of the screening-level environmental analyses employed by the scan. It presents preliminary findings of probable environmental constraints upon project design, approval, and regulatory permitting.

Potential for environmental effects from the construction and operation of the DRC would be limited because the project would primarily use existing rail facilities within the SamTrans-owned right-of-way. However, the proposed project has the potential to generate significant impacts at some locations, such as stations and bridge replacements. The improvements that would generate significant impacts also have benefits associated with them, such as new intermodal connections, travel time savings, and reductions in traffic congestion and vehicle emissions. The technical analyses and consultation conducted as part of the formal environmental review process will be needed to determine specific project impacts and define adequate measures to mitigate adverse impacts resulting from project implementation.

Anticipated Environmental Documents

The project development process for the DRC project will include environmental reviews and approvals consistent with local, state, and federal requirements. The CEQA and NEPA processes will identify impacts and their level of significance, as well as mitigation measures to avoid or reduce the level of these impacts. The preparation of a joint document under these statutes is typical of contemporary transportation projects that have both federal and state/local lead agencies. The required permits and approvals will also be identified in these documents.

Based on probable effects identified by the environmental screening (e.g., likely demolition of historic resources, probable, unavoidable significant impacts, etc.), it is probable that an environmental impact report (EIR) would be required for the DRC Project. Under CEQA, an EIR is completed to analyze the environmental effects of a proposed project, indicate ways to reduce or avoid potential environmental damage resulting from the project, and identify alternatives to the proposed project. An EIR must also disclose significant environmental effects that cannot be avoided, growth-inducing effects, effects found not to be significant, and significant cumulative impacts of a proposed project.

The type of documentation required by NEPA will depend upon whether federal funds are used to construct or operate the DRC service, whether there is a federal action that is required for the project's approval, and the overall level of impact caused by the project. As a regionally significant transportation project, public and agency scoping will be required and will resolve final selection of the appropriate NEPA and CEQA documentation. Either a combined

Environmental Assessment/Finding of No Significant Impacts (EA/FONSI) or combined EIS and EIR will be needed to address significant adverse impacts.

Summary of Probable Impacts

The environmental scan includes screening for potential impacts related to the project operation or project construction in ten subject areas. Some of the key potential impacts identified in the preliminary screening with respect to these subject areas include:

- **Cultural Resources.** Alteration or destruction of historical resources, including two steel-truss swing bridges over the San Francisco Bay and Newark Slough;
- **Special Status Species and Wetlands.** Potential disturbance to wildlife and disturbance to/removal of wetlands or habitat for special-status species;
- **Water Quality and Floodplains.** Potential violation of state and federal water quality standards resulting from construction activity;
- **Noise and Vibration.** Possible impacts to nearby land uses during construction or operation of the project;
- **Hazardous Materials.** Potential presence of hazardous materials at the proposed station sites in Newark and at Willow Road in Menlo Park/East Palo Alto;
- **Traffic Safety.** Added delays to traffic at-grade crossings as well as increased vehicular, pedestrian, and bicycle traffic at and around stations.

Other probable impacts related to the project were also identified for land use and development planning, environmental justice, visual resources/aesthetics, and air quality.

Further technical analyses will be required to determine specific project impacts and define adequate measures to mitigate any adverse impacts resulting from the Dumbarton Rail project. This will take place in the next phase of the environmental process.

RIGHT-OF-WAY

This section is a summary of the Project Study Report Appendix K – Right-of-Way.

A right-of-way acquisition plan has been developed for each segment of track. UPRR agreements will have to be arranged in areas where the track is carrying passenger traffic on existing freight rail. **Table 4** defines all construction easements, UPRR agreements, acquisitions and other easements. Information for Temporary Construction Easements (TCEs) will not be available until more engineering information is collected.



Figure 17: Right-of-Way Segments

Table 3: Right of Way – Temporary Easements, Arrangements and Acquisitions

SEGMENT	Temporary Construction Easements	UPRR Agreement	New Acquisitions
A Redwood Junction to Dumbarton Bridge West Abutment	Final design required, typical all.	None	<ul style="list-style-type: none"> Menlo Park Willow Station – 38,682 sf for station improvements
B Dumbarton Bridge		None	<ul style="list-style-type: none"> None
C Hickory Street to Elm Street, Newark		None	<ul style="list-style-type: none"> Newark Station – 98,475 sf for station improvements
D Elm Street, Newark to Maple Street, Fremont		Agreements for passenger traffic	<ul style="list-style-type: none"> None
E Maple Street to Riverwalk Drive, Fremont		Agreements for passenger traffic	<ul style="list-style-type: none"> Fremont Centerville Station – 5,940 sf for station improvements and access
F Niles Junction Connection Track		No Operating Agreement except for a Construction and Maintenance Agreement	<ul style="list-style-type: none"> Triangular property on south bank – 1,000 sf
G Riverwalk Drive, Fremont to Industrial Blvd, Hayward		Agreements for passenger traffic	<ul style="list-style-type: none"> Rail Corridor Property – 2,257,200 sf Shinn Industrial Property – 185,000 sf Industrial Property at wye north of layover yard – 45,000 sf Residential – 8,000 sf

COST ESTIMATES

This section is a summary of the Project Study Report Appendix L – Cost Estimates.

Both capital, and operating and maintenance cost estimates were prepared, based on the conceptual design and operating plan described in the PSR.

Capital Costs

Project capital costs are estimated by applying typical unit prices to physical quantities obtained from the plan and profile drawings and typical cross sections at the level of design available. For the purpose of a conceptual cost estimate, these quantities and prices are organized in a format that is rolled up into an established work breakdown structure.

In addition, indirect costs are added to the bottom line item of the estimate. Indirect cost includes items such as engineering, construction management, fees, and contingency. These indirect items have been developed as a percentage of the construction cost for each item.

Table 3: Capital Costs by Project Element

Item No.	Description	Total Estimated Cost (\$ millions)
CONSTRUCTION COSTS		
1	Reconstruct existing facilities	2.0
2	Civil Site Work	10.3
3	Structures	52.5
4	Stations	10.3
5	Trackwork	29.5
6	Signals and Communications	16.3
7	Construction Contingency	23.1
TOTAL CONSTRUCTION COST		144.1
OTHER PROJECT COSTS		
8	Engineering/Administration	45.6
9	Right-of-Way	43.4
10	Project Reserve	11.6
TOTAL OTHER PROJECT COSTS		100.6
ROLLING STOCK PURCHASE		55.1
TOTAL PROJECT COST		299.8

Conceptual Operating and Maintenance Costs

Operating and Maintenance (O&M) costs are based on the inputs derived for the Draft 2004-2023 Caltrain Strategic Plan – SRTP O&M Cost Model (SRTP Model). As shown in **Table 5**, O&M costs were developed for two Alternatives:

- Year 2010
- Year 2025

Alternative 1 was presented in the ridership forecasts and operations analysis which assumes three roundtrips between Union City and San Jose and three roundtrips between Union City and San Francisco. It is assumed that the DRC service will be an incremental addition to 2010 Caltrain service and that the costs associated with the Dumbarton service are similar to the costs identified in the 2003 Caltrain Strategic Plan calculated on a per-mile basis.

Table 4: Conceptual Operating and Maintenance Costs

Service Level	Unit Description	2010			2025		
		Units	Quantities	Total	Units	Quantities	Total
Local Trips to San Francisco	Round Trips	1	3	3	1	3	3
Local Trips to San Jose	Round Trips	1	3	3	1	3	3
Total Weekday Round Trips	Round Trips	6	6	6	6	6	6
Daily Train Miles							
Union City/Hayward to SF	Train Miles per Round Trip	87.4	3	262	87.4	3	262
Union City/Hayward to SJ	Train Miles per Round Trip	73.2	3	220	73.2	3	220
Total Daily Miles	Train Miles per Day			482			482
Total Annual Miles	Train Miles per Day x Days per Year	482	250	120,450	482	250	120,450
Ridership							
Estimated Daily Ridership	Number of Boardings per Day	1	4,800		1	6,900	
Total Annual Ridership	Passengers per Day x No. of Days	4800	250	1,200,000	6,900	250	1,725,000
Revenue Component							
Average Fare	Average Fare per Passenger	\$ 2.03			\$ 2.15		
Total Fare Revenue per Year	Average Fare X Total Annual Ridership	\$ 2.03	1,200,000	\$ 2,436,000	\$ 2.15	1,725,000	\$ 3,708,750
CCJPA Trackage Fees	Fee per Train Mile	\$ 2.15	62,313	\$ 133,973	\$ 2.15	90,637	\$ 194,870
Total Revenue				\$ 2,569,973			\$ 3,903,620
Cost Component							
Rail Operator Service	Average Cost per Train Mile	42.08	120,450	\$ 5,068,536	42.08	120,450	\$ 5,068,536
Fuel	Average Cost per Train Mile	4.37	120,450	\$ 526,367	4.37	120,450	\$ 526,367
Timetable & Tickets	Average Cost per Train Mile	0.32	120,450	\$ 38,544	0.32	120,450	\$ 38,544
Insurance	Average Cost per Train Mile	3.79	120,450	\$ 456,506	3.79	120,450	\$ 456,506
JPB Facil & Equip Maintenance	Average Cost per Train Mile	1.63	120,450	\$ 196,334	1.63	120,450	\$ 196,334
Utilities	Average Cost per Train Mile	1.03	120,450	\$ 124,064	1.03	120,450	\$ 124,064
Dumbarton & Newark SI Bridges	Lumpsum	1.00	200,000	\$ 200,000	1.00	200,000	\$ 200,000
UP Trackage Fees	Fee per Train Mile	7.20	5,877	\$ 42,314	7.20	5,877	\$ 42,314
Total Operating Cost				\$ 6,652,663			\$ 6,652,663
Administrative Wages & Benefits	Average Cost per Train Mile	3.63	120,450	\$ 437,234	3.63	120,450	\$ 437,234
Other Administrative Costs	Average Cost per Train Mile	3.19	120,450	\$ 384,236	3.19	120,450	\$ 384,236
Train set lease	Trainset	1	500,000	\$ 500,000	1	500,000	\$ 500,000
Capital Maintenance Fund	Lumpsum				1	1,400,000	\$ 1,400,000
Total All Cost				\$ 7,974,132			\$ 9,374,132
O&M cost shortfall				\$ 5,404,159			\$ 5,470,513
Revenue Recovery				32%			42%

Source: Draft Caltrain Strategic Plan and Parsons Brinckerhoff (2003)

FUNDING

This section provides excerpts from Appendix M - Funding of the main Project Study Report.

Capital Funding Package

Regional Measure 2 will provide \$135 million in construction funds for the Dumbarton Rail project. The balance of funding for the project – which is estimated at a total cost of \$299.5 million – will be provided from state sources and local funds from Alameda, San Mateo, and Santa Clara counties. The capital funding package is summarized in **Table 6**, and is described in more detail below.

Table 5: Capital Funding Package

Sources	2004 - \$ (in millions)	Status
San Mateo	60.0	Programmed
ACTIA	17.0	Programmed
Alameda County CMA	14.0	Programmed
Santa Clara VTA	40.0	Programmed
ITIP (regional)	12.0	Pending
ITIP (CCJPA intercity)	12.0	Pending
Regional Measure 2	135.0	Pending
To be identified	9.8	Pending
Total	299.8	

Regional Measure 2

In the March 2002 general election the voters in Alameda, Contra Costa, Marin, San Mateo, Santa Clara, and San Mateo counties passed the Regional Traffic Relief Plan, Regional Measure 2. The Plan will fund a variety of transportation improvements funded through a \$1 toll increase on the Bay Area's seven state-owned bridges, and are expected to raise approximately \$125 million annually to help relieve traffic congestion and enhance the convenience and reliability of the region's public transit system in the vicinity of the bridge corridors. Included in this Plan was the Dumbarton Rail Corridor which will include \$135 million for capital improvements and \$5.5 million annually for operating and maintenance costs.

County Sales Tax Programs

Alameda, San Mateo, and Santa Clara counties each have voter-approved sales tax programs which have earmarked funding for the DRC project. The funds are generated from a one-half percent local sales tax imposed in each of the three counties.

Alameda County's Measure B, approved in 2000, provides up to \$17 million for improvements in the Dumbarton Corridor. These funds are administered by ACTIA, which has programmed \$13 million for the DRC project in its current Strategic Plan. The City of Newark is expected to apply for the funds from ACTIA, as the local project sponsor within Alameda County.

San Mateo County's Measure A program, approved in 1988, provides \$60 million for the DRC project. These funds are currently available through the SMCTA, which has already expended

\$14 million in support of the project for acquisition of right-of-way from the Southern Pacific Railroad (now UPRR).

Finally, Santa Clara County's 2000 Measure A program authorizes \$40 million for the DRC project. The funds would not likely be available before 2006, when collection of the Measure A sales tax begins. However, the economic downturn in Silicon Valley has led the VTA to revise its sales tax revenue estimates downward, which in turn has forced the agency to begin to reprioritize its expenditure plan for Measure A funds. With Regional Measure 2, VTA is expected to retain funding for the DRC in its expenditure plan.

State Transportation Improvement Program Funds

The California Transportation Commission (CTC) administers the STIP, a five-year inventory of transportation projects slated to receive funding from federal and state gas tax revenues. Seventy-five percent of STIP revenues are apportioned to counties on a formula basis to fund projects chosen at their discretion, within state guidelines. The remaining 25 percent is reserved for the Interregional Transportation Improvement Program (ITIP), which funds projects chosen at the discretion of the CTC.

The Alameda County Congestion Management Agency (ACCMA) has pledged \$14 million from Alameda County's share of future STIP funds for the DRC project. In addition, the CCJPA has agreed to seek up to \$12 million from the ITIP. A portion of the ITIP is reserved for intercity rail routes, which includes the Capitol Corridor service between Sacramento and San Jose. Any ITIP funds allocated to the Capitol Corridor would be used for track improvements that benefit the Capitol Corridor as well as Dumbarton Rail (primarily between Industrial Boulevard and the City of Fremont).

The CTC has estimated that no new funding will be available for programming in the 2004 STIP, due to a number of factors. These include a decline in state gas tax revenues due to the faltering economy, uncertain levels of future federal funding pending reauthorization of TEA-21, and continued diversion of state transportation funds to other programs to offset the state's persistent general fund deficit. Thus, it appears that the earliest opportunity for securing STIP funds through either Alameda County or the Capitol Corridor would be with the 2006 STIP.

Funds to be Identified

Based on the funding package presented above it is estimated that there is about \$9.8 million in additional funding to be identified for capital improvements. It is assumed that these \$9.8 million will be identified as the project develops and through further investigation of potential funding sources. Additional funding sources could include local, regional and state and federal monies including but not limited to: Congestion Management and Air Quality (CMAQ); ITIP, and federal earmarks. The Project Team is confident that the additional \$9.8 million can be secured.

Operating and Maintenance Funding Package

It is estimated that the operations and maintenance (O&M) annual cost for the DRC will be \$8 million in 2010 (\$2004) and \$9.4 million in 2025 (O&M). The O&M costs will be funded by fare revenues, trackage fees from the CCJPA and RM 2, as summarized in **Table 7** below.

Table 6: Operating and Maintenance Funding Package

Sources	2010		2025	
	2004 \$ (millions)		2004 \$ (millions)	
Fare Revenues	2.4	30%	3.7	39%
CCJPA Trackage fees	0.1	2%	0.2	2%
Regional Measure 2	5.5	68%	5.5	59%
Total	8.0	100%	9.4	100%

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