INTRODUCTION AND BACKGROUND

The Dumbarton Rail Corridor (DRC) Project is a proposed passenger rail service spanning the southern portion of the San Francisco Bay and connecting communities in the East Bay (Union City, Fremont, Newark) with communities on the Peninsula (Menlo Park, Redwood City, San Jose, San Francisco). Several studies have been conducted since the early 1990s looking into the feasibility of using the DRC for passenger rail service. In 1994, the San Mateo County Transit District (SamTrans) purchased the DRC right-of-way between Redwood Junction and Newark Junction as an investment for future freight and/or commuter rail service. In 2000 and 2005 the DRC was identified for funding in MTC’s regional transportation plan and in 2006 work began on the environmental analysis for the project.

With the completion of an administrative draft of the project DEIS in late 2009 it became apparent that the cost-effectiveness of the project was less than anticipated. The more detailed engineering studies better defined the requirements of the project but also resulted in increased estimates of construction cost. Meanwhile updated ridership forecasts based on new land use assumptions resulted in reduced forecasts of ridership. In addition to these issues meetings with the Federal Transit Administration (FTA) revealed that the project lacked a sufficiently developed funding plan to proceed to the DEIS stage because funding commitments were less than half of the estimated project costs. In recognition of these concerns the DRC Policy Advisory Committee (PAC) directed the project team to explore ways to improve cost-effectiveness of the project and identify a strategy for securing the necessary project funding.

The project team also considered that over the past few years there have been changes in the future Bay Region rail network. The approval of the High Speed Rail initiative changes the composition of the future rail services which will be operating in the Peninsula and the Altamont Corridors. Recent developments in the BART to San Jose and BART to Livermore projects also have potential impacts. Revised ABAG population and employment forecasts and higher bridge
tolls will likely increase ridership. Because of these changes, there was a need to reassess the opportunities for the DRC and examine alternatives to minimize cost and increase ridership. To this end the Dumbarton Rail Corridor Alternatives Study considers the changing project setting, revised funding prospects, updated ridership estimates and analyzes transit oriented development potential. This work was used to develop and evaluate a series of rail and bus alternatives.

This work was performed under the sponsorship of the San Mateo County Transportation Authority (SMCTA) with the Peninsula Corridor Joint Powers Board (PCJPB) serving as the project administrator for the SMCTA. The project was sponsored by the SMCTA and the Alameda County Transportation Improvement Commission (ACTIA) for inclusion in the Regional Measure 2 (RM2) bridge toll initiative and it is now part of the Resolution 3434 funding program administered by the Metropolitan Transportation Commission (MTC).

During the course of this analysis, the PAC with the support of the Project Development Team (PDT) and the Citizens Advisory Panel (CAP) has guided the planning process by setting priorities, reviewing analysis, and identifying goals and objectives.

**PROJECT OBJECTIVES**

The DRC alternatives study was conducted using the following objectives.

- **Address changing project settings.** With the recent changes of high speed rail legislation, new population and employment forecasts and planned BART extensions, the project setting was modified.
- **Evaluate additional new project alternatives.** These alternatives included rail shuttle service, bus service options, and different origin locations.
- **Review ridership and cost estimates.** Ridership and cost estimates were revised based on new alternatives and updated land use forecasts.

---

**DRC Timeline**

1910 – Dumbarton rail bridge constructed

1982 – Use of rail bridge discontinued

1991 – SMCTA Study, Dumbarton Commuter Service Feasibility Study

1997 – SMCTA Study, Dumbarton Corridor Study

1998 – SMCTA Study, Dumbarton Corridor Transit Concept Plan

1999 – SMCTA Study, Dumbarton Rail Corridor Study

2000/2005 – Dumbarton rail corridor included in MTC’s Regional Transportation Plan

2004 – SMCTA Study Report, Project Study Report (PSR) for the Dumbarton Rail Corridor

2004 – Formation of the Dumbarton Rail Corridor Policy Advisory Committee

2006 – SMCTA, Environmental Phase 1 Document

2008 – High Speed Rail Initiative passed in California

2010 – SMCTA Study, Dumbarton Rail Corridor Alternatives Study
ALTERNATIVES CONSIDERED

Several additional alternatives are being considered for the DRC, including rail and bus alternatives. Rail alternatives include increased rail service, shuttles across the bay and extending service to different locations in the East Bay. Bus alternatives would utilize the Dumbarton Bridge and include transportation systems management (TSM) and Bus Rapid Transit (BRT) options. In all, nine rail alternatives and five bus alternatives were considered for the study. After preliminary assessments, five rail alternatives were fully evaluated and all bus alternatives were evaluated.

Evaluation Criteria

The rail and bus alternatives were evaluated based on a set of five criteria.

Daily Ridership - the number of new transit riders.
Costs - capital, operations and maintenance costs.
Cost Effectiveness - the ratio of new transit riders to costs. More riders with lower costs equals greater cost effectiveness.
TOD Potential - the future potential households located within a half-mile of future transit stations.
Operational Feasibility* - considers the requirements of integrated operations with existing rail systems and potential operational conflicts.

*Operation Feasibility was assessed for rail alternatives only.
RAIL ALTERNATIVES

After the initial screening process of rail alternatives, the remaining options were subjected to a detailed review and evaluation. This list of alternatives includes the original project, increased service, and shuttles between BART and Caltrain. The final rail alternatives for analysis include the following.

R1. **Original Project**: Peak direction rail service between Union City and San Francisco and Union City and San Jose with 60 minute headways and no off-peak service.

R2. **Increased Service – Bi-Directional**: Rail service between Union City and San Francisco and Union City and San Jose during peak periods with 30 minute headways. Off-peak bi-directional shuttle between Union City and Redwood City with 30 minute headways.

R3. **Rail Shuttle – Union City**: Bi-directional peak period service between Union City and Redwood City with 15 minute headways.

R4. **Rail Shuttle – Shinn**: Bi-directional all day service between Shinn in Fremont and Redwood City with 15 minute headways.

R5. **Original Project + Rail Shuttle**: Peak direction rail service between Union City and San Francisco and Union City and San Jose with 60 minute headways. Bi-directional peak rail shuttle service between Union City and Redwood City with 30 minute headways.

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**Evaluation of Rail Alternatives**

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<tr>
<th>Alternative</th>
<th>Ridership</th>
<th>Total Costs</th>
<th>Cost Effectiveness</th>
<th>TOD Potential</th>
<th>Operational Feasibility</th>
<th>Best Alternatives</th>
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- ☺ = Worst  ☻ = Below Average  ☢ = Above Average  ☤ = Best
LAND USE ANALYSIS

The purpose of the land use analysis was to identify opportunities for new development in proximity to potential transit stations along the Dumbarton Rail Corridor, and to identify opportunities for transit-oriented development (TOD) that may boost the ridership potential of future Dumbarton rail service. The stations considered in the analysis included: East Palo Alto/Menlo Park, Downtown Menlo Park, Fremont-Centerville, Fremont-Warm Springs, Downtown Livermore, Livermore-Vasco Road, Newark, North Fair Oaks, Redwood City, and Union City.

In addition to ABAG employment and population forecasts, the land use analysis identified underutilized lands where potential future TOD may be appropriate. “Moderate” and “aggressive” development intensities were assigned to lands within each station area that could reasonably be assumed to be developed at a higher density. The moderate and aggressive projections represent development beyond current existing adopted plans and policies. The number of new potential riders was calculated to be 0.5 rider per household.

Transit extension projects funded by MTC Resolution 3434 (TOD Policy) must plan for a minimum number of housing units along the corridor, which vary by mode of transit. The land use analysis considers these thresholds in comparison to population forecasts.

The land use analysis concluded that the DRC project would be able to satisfy the requirements of 3434 without further changes in land use policy. It also concluded that there is potential for significant growth of the areas around the stations if the local jurisdictions were to allow increased density of development. Any development beyond the levels forecasts by ABAG would represent a source of additional ridership on the DRC project. This would improve project cost-effectiveness and enhance the competitiveness of the project in terms of securing funding.
BUS ALTERNATIVES

The bus alternatives include TSM and BRT service options. The bus alternatives include the following:

B1. **Original Bus TSM**: Four Routes based on original DEIS/EIR approved TSM alternative (August 2008). Routes include: Union City to Stanford Research Park; Fremont to Stanford University; Mission San Jose to NASA; South Hayward to Oracle.

B2. **Enhanced Bus TSM**: Routes from Original TSM modified. Bus preferential treatments include transit-only lanes and allowing shoulder operations. Routes include: Union City to Stanford Research Park; Fremont to Stanford University; Mission San Jose to Oracle; South Hayward to NASA.

B3. **BRT – Bayfront Express Busway**: Same routes of Enhanced Bus TSM. Expanded Bus preferential treatments include elevated bus HOV lanes on the Bayfront Expressway, transit-only on/off ramps, grade separations at Bayfront/Willow and Bayfront/University, transit-only lanes, and allowing shoulder operations. Routes include: Union City to Stanford Research Park; Fremont to Stanford University; Mission San Jose to Oracle; South Hayward to NASA.

B4. **BRT Shuttle – Union City to Redwood City**: Bi-directional bus service between Union City and Redwood City. Includes bus preferential treatments similar to those included in Enhanced Bus TSM (#B2).

B5. **Enhanced Bus TSM + BRT Shuttle**: Combines the Union City – Stanford Research Park and Fremont – Stanford University routes from the Enhanced Bus TSM alternative with the BRT shuttle bus service between Union City and Redwood City.

### Ridership of Bus Alternatives

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<tr>
<th>Alternative</th>
<th>Ridership</th>
<th>Total Costs</th>
<th>Cost Effectiveness</th>
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- ![Rank](排名) = Worst
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RECOMMENDED EIR/EIS ALTERNATIVES

Based on the alternatives evaluation described in the previous section, the following set of alternatives are recommended for study in the EIR/EIS.

- No Build
- Original Project (Rail)
- Rail Shuttle - Union City (Rail)
- Original Project + Rail Shuttle (Rail)
- Enhanced Bus TSM + BRT Shuttle (Bus)

FUNDING STRATEGY

The success in funding large infrastructure projects such as DRC relies on political will and leadership, stakeholder support, project readiness, seizing opportunities and patience. Currently, there are $345 million in commitments from seven different sources. Local sources include local sales taxes in Alameda, San Mateo and Santa Clara counties, and bridge tolls. State sources include ITIP and RTIP. VTA’s sales tax commitment of $44 million is described in the Santa Clara Measure A ballot initiative (in 2000) and in the 2035 VTP (January 2009). However, this source of funds is no longer committed in VTA’s 10 year SRTP. ITIP funds are committed to the project in Resolution 3434. However, this source of funds is subject to state budget approval and may be at risk. RTIP funds are committed as a result of a swap of RM2 funds for future Alameda County RTIP funds. However, this source of funds is subject to state budget approval and may be at risk. Given the status of the state budget, RTIP funds are unlikely to be available for several years.

A $400+ million funding gap exists for the rail DRC alternatives. There are several new opportunities for funding, including:

- MTC’s Transit Sustainability Project. Funding for transit in the region and the possible expansion of bridge tolls.
- Alameda Countywide Transportation Plan. Provides funding for all transportation modes and will consider a new sales tax measure and expenditure plan.
- Federal Transportation Bill. Re-authorization will outline federal funding for the next five years, which the DRC may be able to compete for in the future.

NEXT STEPS

In order to move forward with DRC planning and implementation, the following initial steps were discussed with the PAC. In November of 2010 the PAC (after approvals from the both the PDT and CAP) gave the project team direction to proceed with the following:

- Proceed with planning, design and environmental studies, including preparation of EIR/EIS.
- Secure additional funding sources and prepare full funding plan.
- Complete 15% design.

It was noted that although the project is included in the Resolution 3434 list of regional projects, it is currently ranked in tier 4. It is clear that in order to compete with the host of other projects in the Bay Region, this project will need the full support of its funding partners and the rest of the region to advance to implementation.
ACKNOWLEDGEMENTS

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Nancy Whelan & Associates
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DUMBARTON RAIL
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PROJECT PURPOSE AND BACKGROUND

The Dumbarton Rail Corridor (DRC) Project is a proposed passenger rail service spanning the southern portion of the San Francisco Bay and connecting communities in the East Bay (Union City, Fremont, Newark) with communities on the Peninsula (Menlo Park, Redwood City, the South Bay (San Jose) and San Francisco, (see Map 1). Several studies have been conducted since the early 1990s looking into the feasibility of using the DRC for passenger rail service. The original cities targeted for service included: Menlo Park, East Palo Alto, Newark, Fremont/Centerville, Union City, Redwood City, San Carlos, Belmont, Hillsdale, Hayward Park, San Mateo, Burlingame, Broadway, Millbrae, San Francisco, Atherton, Palo Alto, Mountain View, Sunnyvale, Santa Clara, and San Jose. These encompassed four new stations as well as additional service at existing Caltrain Stations.

In 1994, the San Mateo County Transit District (SamTrans) purchased the DRC right-of-way between Redwood Junction and Newark Junction as an investment for future freight and/or commuter rail service. The project team also considered that over the past few years there have been changes in the future Bay Region rail network. The approval of the High Speed Rail initiative changes the composition of the future rail services which will be operating in the Peninsula and the Altamont Corridors. Recent developments in the BART to San Jose and BART to Livermore projects also have potential impacts. Revised ABAG population and employment forecasts and higher bridge tolls will likely increase ridership. Because of these changes, there was a need to reassess the opportunities for the DRC and examine alternatives to minimize cost and increase ridership. To this end the Dumbarton Rail Corridor Alternatives Study considers the changing project setting, revised funding prospects, updated ridership estimates and analyzes transit oriented development potential. This work was used to develop and evaluate a series of rail and bus alternatives.

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**ALTERNATIVES STUDY OBJECTIVES**

The DRC alternatives study was conducted using the following objectives.

- Address changing project settings. With the recent changes of high speed rail legislation, new population and employment forecasts and planned BART extensions, the project setting was modified.
- Evaluate additional project alternatives. These project alternatives included rail shuttle service, bus service options, and different origin locations.
- Review ridership and cost estimates. Ridership and cost estimates were revised based on new alternatives and project setting information.

**DRC PROJECT COMMITTEES**

**Policy Advisory Committee**

The Policy Advisory Committee (PAC) was formed to guide strategic planning for the DRC and is made up of representatives for the local jurisdictions and transit agencies involved in the DRC project. During the course of this analysis, the PAC has guided the planning process by setting priorities, reviewing analysis, and identifying goals and objectives.

**Project Development Team**

The Project Development Team (PDT) consists of technical staff representatives from the local jurisdictions and transit agencies involved in the DRC project.

**Citizens Advisory Panel**

The Citizens Advisory Panel (CAP) is made up of regional residents from the East Bay and the Peninsula cities located in the DRC study area. The CAP provided an important advisory role throughout the planning process, and met to review materials, share ideas and provide feedback to the PAC and project team.

**REPORT OVERVIEW**

The Dumbarton Rail Corridor Alternatives Study is organized into the following sections.

1. **Introduction and Background.** Provides an overview of the DRC project and the purpose of the alternatives study.
2. **Alternatives Considered.** Describes the full range of alternatives considered for the alternatives study.
3. **Alternatives Evaluation and Comparison.** Describes evaluation metrics used for the comparison of alternatives.
4. **Recommendations and Next Steps.** Outlines the alternatives study recommendations and next steps in the planning process.

---

**DRC Timeline**

1910 – Dumbarton rail bridge constructed
1982 – Use of rail bridge discontinued
1991 – SMCTA Study, Dumbarton Commuter Service Feasibility Study
1997 – SMCTA Study, Dumbarton Corridor Study
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2004 – Formation of the Dumbarton Rail Corridor Policy Advisory Committee
2006 – SMCTA, Environmental Phase 1 Document
2008 – High Speed Rail Initiative passed in California
2011 – SMCTA Study, Dumbarton Rail Corridor Alternatives Study
Several additional alternatives are being considered for the DRC as part of this analysis, including rail and bus options. Rail alternatives include increased rail service, rail shuttles across the bay and extending service to different locations in the East Bay. Bus alternatives utilize the Dumbarton Bridge and include transportation systems management (TSM) and Bus Rapid Transit (BRT) options. In all, nine rail alternatives and four bus alternatives were considered for the study. The alternatives will connect to existing Caltrain service in the peninsula, BART, Capital Corridor and ACE Service in the East Bay and proposed High Speed Rail Service in the East Bay and Peninsula depending on the alternatives evaluated.

This section presents the stations, initial list of rail and bus alternatives, the screening process for refining the list, and the final alternatives considered for the full evaluation.

**STATIONS**

There are four proposed, primary DRC stations:

- Union City Intermodal Station;
- Fremont Centerville Station;
- Willow Street Station in Newark; and
- Willow Road in Menlo Park.

In all, a total of 24 stations were analyzed for travel demand purposes: four (4) stations along the DRC and 20 that are part of the current Caltrain system. These stations are summarized below:

- Dumbarton Line: Union City Intermodal Station, Fremont Centerville, Willow Street in Newark, Willow Road in Menlo Park, and 2nd Avenue in San Mateo County
- Caltrain North: Redwood City, San Carlos, Belmont, Hillsdale, Hayward Park, San Mateo, Burlingame, Broadway, Millbrae, San Francisco (4th and King)
- Caltrain South: Atherton, Menlo Park, Palo Alto, California Ave, San Antonio, Mountain View, Sunnyvale, Lawrence, Santa Clara, San Jose

**INITIAL LIST OF ALTERNATIVES**

**Rail**

**Original Project**: Peak period, Peak direction only; 60 minute headways on two routes; 11 stations. Origin-destination pairs include: Union City to San Francisco; and Union City to San Jose.

**Increased Service - Bi-Directional**: Peak period, Peak direction, Bi-directional off-peak shuttle to Redwood City; 30 minute headways; 11 stations. Origin-destination pairs include: Union City to San Francisco (Peak); Union City to San Jose (Peak); and Union City to Redwood City.

**Increased Service - South Only**: Peak period, Peak direction, Bi-directional off-peak shuttle to Menlo Park; 30 minute headways; 5 stations (peak) and 5 stations off-peak. Origin-destination pairs include: Union City to Mountain View (Peak), and Union City to Menlo Park (Off-Peak).

**Rail Shuttle - Union City (15 minute)**: Bi-directional all-day service; 15 minute headways; 5 stations. Origin-destination pairs include: Union City to Redwood City.

**Rail Shuttle - Union City (30 minute)**: Bi-directional all-day service, less frequent service; 30 minute headways; 5 stations. Origin-destination pairs include: Union City to Redwood City.

**Rail Shuttle - Shinn**: Bi-directional all-day service; 4 stations. New BART station at Shinn acting as transfer hub for BART, ACE, Amtrak, DRC, HSR; 15 minute headways; 4 stations.
headways. Origin-destination pairs include: Shinn to Redwood City.

**Extended Service - Livermore (Super ACE/HSR) to Redwood City:** Connects to ACE/HSR at Livermore (Downtown and Vasco Road), Bi-directional service; 30 minute peak headways and 60 minute off-peak headways; 7 stations. Origin-destination pairs include: Livermore to Redwood City.

**Extended Service - Warm Springs (Super ACE/HSR) to Redwood City:** Connects to ACE/HSR at planned Warm Springs BART, Bi-directional service; 30 minute peak headways and 60 minute off-peak headways; 5 stations. Origin-destination pairs include: Warm Springs to Redwood City.

**Bus**

**Original Bus TSM:** Four Routes based on original DEIS/EIR approved TSM alternative (August 2008). Routes include: Union City BART to Stanford Research Park (Bi-directional, peak, midday and weekend service); Fremont BART to Stanford University (Bi-directional, peak, and midday service); Mission San Jose (Park and Ride South Line) to NASA/Ames VTA LRT Station (Peak direction only); South Hayward BART to Oracle (Peak direction only). The Original Bus TSM is based on existing AC Transit Dumbarton Express bus service.

Bus stops:

- **Union City (Yellow):** EB Stops: Union City BART Station, Fremont Blvd, Ardenwood Park and Ride, Proposed, WB Stops: Proposed Menlo Park Station, Menlo Park VA Hospital, Stanford University, Page Mill Rd/El Camino Real Park-n-Ride, Hillview Ave/ Hanover Street, Stanford Research Park, Stanford VA Hospital
- **Fremont (Red):** EB Stops: Fremont BART, Centerville ACE/Amtrak station, Newark Station (Willow Street), WB Stops: Proposed Menlo Park station, Stanford University (3 stops)
- **Mission San Jose (Blue to Green):** EB Stops: Mission San Jose Park and Ride, Newpark Mall, Washington Blvd/Fremont Blvd, Fremont Blvd/Mowry Ave, Ardenwood Park and Ride, WB Stops: Proposed Menlo Park Station, Google Campus, Microsoft, NASA/Ames Research Center, Bayshore/NASA LRT station
- **South Hayward (Green to Blue):** EB Stops: South Hayward BART, Union Landing Transit Center, Dryer Street/Union City Boulevard, Ardenwood Park and Ride, WB Stops: Proposed Menlo Park Station, Broadway, Redwood City Caltrain Station, Electronics Arts, Oracle Headquarters

**Enhanced Bus TSM:** Routes from Original TSM modified. Bus preferential treatments include transit-only lanes and allowing shoulder operations. Routes include: Union City to Stanford Research Park (Yellow); Fremont to Stanford University (Red); Mission San Jose to RWC Caltrain (Blue to Green); South Hayward to NASA (Green to Blue).

Bus stops:

- **Union City (Yellow):** Same as original TSM
- **Fremont (Red):** Same as original TSM
- **Mission San Jose (Blue to Green):** EB Stops: Mission San Jose Park and Ride, Newpark Mall, Washington Blvd/Fremont Blvd, Fremont Blvd/Mowry Ave, Ardenwood Park and Ride, WB Stops: Proposed Menlo Park Station, Broadway, Redwood City Caltrain Station, Electronics Arts, Oracle Headquarters
- **South Hayward (Green to Blue):** EB Stops: South Hayward BART, Union Landing Transit Center, Dryer Street/Union City Boulevard, Ardenwood Park and Ride, WB Stops: Proposed Menlo Park Station, Google Campus, Microsoft, NASA/Ames Research Center, Bayshore/NASA LRT station

**BRT – Bayfront Express Busway:** Same routes and stops from Enhanced Bus TSM. Expanded Bus preferential treatments include elevated HOV lanes on the Bayfront Expressway, transit-only on/off ramps, transit-only lanes and allowing shoulder operations. Grade separations for the elevated HOV lanes are described as Alternative 3: Grade Separations at Bayfront/Willow and Bayfront/University in the 2020 Peninsula Gateway Corridor Study:

This alternative would grade separate both Willow Road and University Avenue intersections below the existing expressway, essentially creating a freeway segment with full control of access that would benefit regional traffic connecting between the Dumbarton Bridge and Highway 101 in both directions. The alternative would provide a direct express connection on Bayfront Expressway between Highway 101 and the Dumbarton Bridge, with uninterrupted traffic flow on the stretches of highway that would normally be delayed by signalized intersections at Willow Road and University Avenue. Also, this alternative would provide a direct connection from westbound Bayfront Expressway to
Willow Road and Bayfront to University Avenue via flyover ramps. Although this alternative only includes a railroad grade separation on Willow Road at the Union Pacific/Dumbarton Rail tracks, a similar facility could be included at University. All other traffic would utilize the depressed intersections to make similar movements as they would now.

Routes for this alternative include: Union City to Stanford Research Park; Fremont to Stanford University; Mission San Jose to RWC Caltrain; South Hayward to NASA.

**BRT Shuttle – Union City to Redwood City:** Bi-directional bus service between Union City BART and Redwood City Caltrain. This alternative includes the same improvements as the enhanced TSM alternative: bus preferential treatment including exclusive bus lanes on the Bayfront Expressway – eastbound direction.

Bus stops: Union City BART, Newark, Ardenwood, Willow Road, Marsh Road, and Redwood City Caltrain.

**SCREENING PROCESS**

The initial options listed above were subjected to a screening process that was designed to identify the most promising alternatives to focus further detailed evaluation and comparison. The screening process identified potential flaws or deficiencies of the alternatives by considering the following criteria:

- Implementation feasibility;
- Operational issues;
- Ridership potential; and
- Costs.

After reviewing results of the screening process and discussing the findings with the PAC in the September 30, 2010 meeting, several alternatives were removed from consideration, including:

- **Increased Service - South Only**
  - Low ridership in comparison to increased bi-directional service alternative
- **Rail Shuttle - Union City to Redwood City (30 minute)**
  - Low ridership as compared with the 15 minute shuttle option

**REFINED LIST OF ALTERNATIVES**

After the initial screening process of alternatives, the remaining options were subjected to a more detailed review, evaluation and comparison. The rail alternatives include the original project, increased service, and shuttles between BART and Caltrain. The 15 minute rail shuttle to Union City alternative is included, but is modified to peak service only. Also, it should be noted it is assumed the existing rights-of-way (ROW) will be used for these alternatives, but it may be necessary to expand ROWs in some of the alternatives. This analysis is conceptual only and the specific ROW requirements will be defined in the DEIS.

The bus alternatives include the TSM and the BRT service options. They have been numbered as R1 to R5 for rail alternatives and B1 to B5 for bus alternatives.

One additional rail alternative and one additional bus alternative were introduced that are combinations of two alternatives in the initial list. These two alternatives include R5, which combines the original project with the Union City rail shuttle (peak), and B5, which combines the enhanced bus TSM with the BRT shuttle.

**Rail**

The final rail alternatives for analysis include the following.

R1. **Original Project:** Peak direction rail service between Union City and San Francisco and Union City and San Jose with 60 minute headways and no off-peak service.

R2. **Increased Service – Bi-Directional:** Rail service between Union City and San Francisco and Union City and San Jose during peak periods with 30 minute headways. Off-peak bi-directional shuttle between Union City and Redwood City with 30 minute headways.

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1. Ridership potential was measured by VTA sensitivity runs of potential alternatives. The model ridership results helped to refine the list alternatives.
R3. **Rail Shuttle – Union City**: Bi-directional peak period service between Union City and Redwood City with 15 minute headways.

R4. **Rail Shuttle – Shinn**: Bi-directional all day service between Shinn in Fremont and Redwood City with 15 minute headways.

R5. **Original Project and Rail Shuttle – Union City**: Peak direction rail service between Union City and San Francisco and Union City and San Jose with 60 minute headways. Bi-directional peak rail shuttle service between Union City and Redwood City with 30 minute headways. The stations, origin destination pairs and service plans were maintained. The frequency for the Union City Rail Shuttle was reduced from 15 minutes to 30 minutes.

**Bus**

The final bus alternatives for analysis included all of the identified options, as they all performed well in the initial screening. All bus alternatives will be operated on the freeway bridge. They include:

**B1. Original Bus TSM**: Four Routes based on original DEIS/EIR approved TSM alternative (August 2008). Routes include:
- Union City to Stanford Research Park (Bi-directional)
- Fremont to Stanford University (Bi-directional)
- Mission San Jose to NASA (Peak direction only)
- South Hayward to Oracle (Peak direction only)

**B2. Enhanced Bus TSM**: Routes from Original TSM modified. Bus preferential treatments include transit-only lanes and allowing shoulder operations. Routes include:
- Union City to Stanford Research Park
- Fremont to Stanford University
- Mission San Jose to Redwood City Caltrain
- South Hayward to NASA

**B3. BRT – Bayfront Express Busway**: Same routes from Enhanced Bus TSM. Expanded Bus preferential treatments include elevated HOV lanes on the Bayfront Expressway, transit-only on/off ramps, transit-only lanes and allowing shoulder operations. Routes include:
- Union City to Stanford Research Park

**B4. BRT Shuttle – Union City to Redwood City**: Bi-directional bus service between Union City and Redwood City. Includes bus preferential treatment including exclusive bus lanes.

**B5. Enhanced Bus TSM and BRT Shuttle**: Combines two of the four enhanced Bus TSM Alternatives: the Union City – Stanford Research Park and Fremont – Stanford University routes with the BRT shuttle bus service between Union City and Redwood City.
The refined list of alternatives that emerged from the screening process was subjected to a more comprehensive evaluation process. The process was based on a set of evaluation criteria that were developed to provide a comparison of the ability of the alternatives to satisfy the basic project goals.

**EVALUATION CRITERIA**

The alternatives were evaluated based on a set of five criteria.

- **Daily Ridership** – the number of new transit riders was the primary consideration, however total daily boardings and transbay trips were also considered;
- **Costs** – total capital costs and annual operations and maintenance costs;
- **Cost Effectiveness** – the ratio of new transit riders to total annualized costs. More riders with lower costs equals greater cost effectiveness;
- **TOD Potential** – the future potential households located within a half-mile of transit stations; and
- **Operational Feasibility** – considers the requirements of integrated operations with existing rail systems and potential operational conflicts. Caltrain peninsula rail services, Capital Route trains, ACE services, and UPPR freight service operations pose potential conflicts with a DRC service.

**DAILY RIDERSHIP**

The Santa Clara Valley Transportation Authority (VTA) travel demand model formed the basis for the ridership model, using 2009 Association of Bay Area Government (ABAG) projections for growth. Previous ridership forecasts for the DRC project had been based on ABAG Projections 2005 for the year 2030. Appendix A provides further details regarding VTA ridership projections for six of the alternatives.

The revised ABAG job and population forecasts released in 2009 triggered changes to VTA’s travel demand model. 2009 ABAG forecasts included significant revisions to job and population numbers for both the east bay and the peninsula. The VTA model was used to develop forecasts for the original rail project, the increased service alternative, the Union City rail shuttle, and the extended rail service concept to Livermore. The consultant team used these ridership estimates to develop ridership numbers for all of the alternatives considered. This process was also used for the bus alternatives.

Ridership estimates were developed for the original DRC project as well as all the other alternatives. The year 2035 ridership for the Original Project was 3,200 new transit riders. The Rail Shuttle – Union City alternative performed the best overall in terms of ridership, generating 4,600 new transit riders. The Original Project plus the Rail Shuttle alternative, was second best overall with 4,800 new transit riders. Table 1 shows year 2035 daily ridership estimates for each of the rail alternatives.
The bus alternatives were also compared in terms of the daily ridership estimates for the year 2035. The results show that B3 and B4 would have higher ridership compared with the other bus alternatives. Table 2 shows daily ridership estimates for each of the bus alternatives. Alternative B5: Enhanced Bus TSM plus BRT Shuttle performed very well, equaling the ridership of the BRT – Bayfront Express Busway alternative.

Table 1: Rail Alternatives (2035)

<table>
<thead>
<tr>
<th>Rail Alternatives</th>
<th>Boardings</th>
<th>Transbay</th>
<th>New Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1: Original Project</td>
<td>8,600</td>
<td>6,800</td>
<td>3,200</td>
</tr>
<tr>
<td>R2: Increased Service - Bi-directional</td>
<td>11,600</td>
<td>9,300</td>
<td>4,300</td>
</tr>
<tr>
<td>R3: Rail Shuttle - Union City</td>
<td>14,400</td>
<td>9,400</td>
<td>4,600</td>
</tr>
<tr>
<td>R4: Rail Shuttle - Shinn</td>
<td>14,000</td>
<td>9,100</td>
<td>4,500</td>
</tr>
<tr>
<td>R5: Original Project + Rail Shuttle</td>
<td>12,700</td>
<td>10,200</td>
<td>4,800</td>
</tr>
</tbody>
</table>

Table 2: Bus Alternatives (2035)

<table>
<thead>
<tr>
<th>Rail Alternatives</th>
<th>Boardings</th>
<th>Transbay</th>
<th>New Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1: Original Bus TSM</td>
<td>4,700</td>
<td>1,800</td>
<td>900</td>
</tr>
<tr>
<td>B2: Enhanced Bus TSM</td>
<td>7,500</td>
<td>2,900</td>
<td>1,450</td>
</tr>
<tr>
<td>B3: BRT - Bayfront Express Busway</td>
<td>9,400</td>
<td>3,500</td>
<td>1,750</td>
</tr>
<tr>
<td>B4: BRT Shuttle - Union City to Redwood City</td>
<td>6,000</td>
<td>2,400</td>
<td>1,300</td>
</tr>
<tr>
<td>B5: Enhanced Bus TSM + BRT Shuttle</td>
<td>9,400</td>
<td>3,500</td>
<td>1,750</td>
</tr>
</tbody>
</table>

**COSTS: CAPITAL, OPERATIONS AND MAINTENANCE**

An important criterion for evaluating the DRC alternatives is the cost to implement, construct and operate the project. Capital, operations and maintenance cost estimates were developed for each of the alternatives. Capital costs include the costs of land acquisitions for station and track improvement (right of way), construction, infrastructure improvements including flyover connections, layover/siding, additional tracking, maintenance facilities and train-sets. Operation and maintenance costs include fuel/energy and labor costs and vehicle, station and track maintenance. See Appendix B for further details regarding capital, operations and maintenance costs.

**Rail Costs**

The cost of R1: Original Project is $700 million including $632 million for facilities and $68 million for vehicles. By comparison, both alternatives R2: Increased Service – Bi-Directional and R3: Rail Shuttle – Union City are estimated to have higher facility and vehicle costs, which total $892 million and $816 million, respectively. Alternative R4: Rail Shuttle – Shinn includes a new BART station at Shinn and is estimated to cost $910 million. Alternative R5: Original Project and Rail Shuttle is estimated to cost $777 million.

Annual operations and maintenance costs range from $7 million for alternative R1 to $41 million for alternative R3. Higher costs for alternatives R2, R3, R4, and R5 are due to the increased train frequency and trips per day that characterize these options as compared to the Original Project alternative. Table 3 shows estimated costs for each of the rail alternatives.

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2 Analysis assumed Caltrain commuter rail rolling stock (i.e. Conventional commuter rail equipment).
Bus Costs
Capital costs for the bus alternatives range from $21 million for alternative B1: Original TSM to $209 million for alternative B3: BRT – Bayfront Express Busway. The relatively high cost for the BRT – Bayfront Expressway alternative is due to the provision of an elevated bus/HOV structure over Bayfront Expressway between the Dumbarton Bridge and the Marsh Road intersection. The other alternatives, with the exception of the Original Bus TSM alternative, include extensive transit priority treatments such as bus only lanes and ramps, traffic signal priority at intersections (Willow, University and Marsh among others), and intersection queue jump lanes for buses. Table 4 shows estimated costs for each of the bus alternatives.

Table 3: Rail Alternatives – Costs (Millions)

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Cost Considerations</th>
<th>Capital Costs Facilities</th>
<th>Capital Costs Vehicles</th>
<th>Capital Costs Total</th>
<th>O&amp;M Costs</th>
<th>Annualized Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1: Original Project</td>
<td>--</td>
<td>$632</td>
<td>$68</td>
<td>$700</td>
<td>$7</td>
<td>$49</td>
</tr>
<tr>
<td>R2: Increased Service - Bi-directional</td>
<td>Includes $50M in West Bay rail improvements and $30M in East Bay rail improvements</td>
<td>$712</td>
<td>$180</td>
<td>$892</td>
<td>$27</td>
<td>$80</td>
</tr>
<tr>
<td>R3: Rail Shuttle - Union City (Peak Service Only)</td>
<td>Includes $30M in Redwood City Station rail improvements and $60M in East Bay rail improvements</td>
<td>$722</td>
<td>$94</td>
<td>$816</td>
<td>$16</td>
<td>$64</td>
</tr>
<tr>
<td>R4: Rail Shuttle - Shinn</td>
<td>Includes $30M in Redwood City Station rail improvements and $60M in East Bay rail improvements plus $100M for a new Shinn BART Station</td>
<td>$822</td>
<td>$88</td>
<td>$910</td>
<td>$30</td>
<td>$84</td>
</tr>
<tr>
<td>R5: Original Project + Rail Shuttle (Peak Service Only)</td>
<td>Includes $30M for Redwood City Station rail improvements</td>
<td>$662</td>
<td>$115</td>
<td>$777</td>
<td>$15</td>
<td>$62</td>
</tr>
</tbody>
</table>

Notes: The assumed lifespan(s) for capital improvements were 50 years for infrastructure, 30 years for rolling stock and 12 years for buses.

Table 4: Bus Alternatives – Costs (Millions)

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Cost Considerations</th>
<th>Capital Costs Facilities</th>
<th>Capital Costs Vehicles</th>
<th>Capital Costs Total</th>
<th>O&amp;M Costs</th>
<th>Annualized Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1: Original Bus TSM</td>
<td>--</td>
<td>$13</td>
<td>$8</td>
<td>$21</td>
<td>$10</td>
<td>$12</td>
</tr>
<tr>
<td>B2: Enhanced Bus TSM</td>
<td>Includes $30M for shoulder bus-only lanes and bus priority treatments</td>
<td>$43</td>
<td>$12</td>
<td>$55</td>
<td>$16</td>
<td>$21</td>
</tr>
<tr>
<td>B3: BRT - Bayfront Express Busway</td>
<td>Includes $30M for shoulder bus-only lanes and bus priority treatments plus $150M for an elevated Bus/HOV structure on the Bayfront Expressway</td>
<td>$193</td>
<td>$16</td>
<td>$209</td>
<td>$16</td>
<td>$35</td>
</tr>
<tr>
<td>B4: BRT Shuttle - Union City to Redwood City</td>
<td>Includes $50M for shoulder bus-only lanes and bus priority treatments and for BRT station stops</td>
<td>$63</td>
<td>$14</td>
<td>$77</td>
<td>$10</td>
<td>$17</td>
</tr>
<tr>
<td>B5: Enhanced Bus TSM + BRT Shuttle</td>
<td>Includes $50M for shoulder bus-only lanes and bus priority treatments and for BRT station stops</td>
<td>$63</td>
<td>$19</td>
<td>$82</td>
<td>$14</td>
<td>$21</td>
</tr>
</tbody>
</table>
COST-EFFECTIVENESS (RIDERSHIP VS. COSTS)

The annualized cost of each alternative was evaluated against its ability to generate new transit riders. Annualized costs equal the capital cost of project implementation spread over the effective life span of the project plus the annual costs of operation and maintenance. Cost-effectiveness is then the ratio of the total annualized costs per the number of new annual transit riders. The lower the cost per new rider, the more cost-effective a given alternative. To compare the alternatives the cost effectiveness performance was ranked on a relative scale of 0 to 10, with 10 representing the most cost-effective alternative and 0 the least. See Appendix C for additional details regarding cost-effectiveness.

Rail Cost-Effectiveness

The cost-effectiveness of R1: Original Project was a nine due to the relatively low cost of this alternative and moderate ridership. Alternative R3: Rail Shuttle – Union City scored a 10. It had increased ridership compared to the original project, but also involved additional cost. Alternative R5: Original Project plus Rail Shuttle was the best performing alternative, with a relative score of 10. Table 5 presents the cost-effectiveness results for the rail alternatives.

Bus Cost-Effectiveness

The cost-effectiveness score of the B1: Original Bus TSM alternative was nine because of its relatively low cost. Alternative B4: BRT Shuttle also scored a nine. The only poor performing alternative was B3: Bayfront Expressway BRT. This alternative did not generate enough ridership to offset its relatively high costs. Alternative R5: Enhanced TSM plus BRT Shuttle was the best performing alternative. Table 6 presents the results for the bus alternatives.
TOD POTENTIAL (LAND USE ANALYSIS)

The purpose of the land use analysis was to identify opportunities for new development in proximity to potential transit stations along the Dumbarton Rail Corridor, and to identify opportunities for transit-oriented development (TOD) that may boost the ridership potential of future Dumbarton rail service. The stations considered in the analysis included: East Palo Alto/Menlo Park, Downtown Menlo Park, Fremont-Centerville, Fremont-Warm Springs, Downtown Livermore, Livermore-Vasco Road, Newark, North Fair Oaks, Redwood City, and Union City.

In addition to ABAG employment and population forecasts, the land use analysis identified underutilized lands where potential future TOD may be appropriate. “Moderate” and “aggressive” development intensities were assigned to lands within each station area that could reasonably be assumed to be developed at a higher density. The moderate and aggressive projections represent development beyond current existing adopted plans and policies. The number of new potential riders was calculated to be 0.5 rider per household. See Appendix D for the full land use analysis report.

Transit extension projects funded by MTC Resolution 3434 (TOD Policy) must plan for a minimum number of housing units along the corridor, which vary by mode of transit. The land use analysis considers these thresholds in comparison to population forecasts (see Figure 1).

The land use analysis concluded that the DRC project would be able to satisfy the requirements of 3434 without further changes in land use policy. It also concluded that there is potential for significant growth of the areas around the stations if the local jurisdictions were to allow increased density of development. Any development beyond the levels forecasts by ABAG would represent a source of additional ridership on the DRC project. This would improve project cost-effectiveness and enhance the competitiveness of the project in terms of securing funding.

3 DC&E’s assumptions regarding “moderate” and “aggressive” densities were informed by the setting in which each station area was located, i.e. whether it is a “downtown,” “node,” or “suburban” station area. Downtown: moderate 30-60 du/ac, aggressive: 50-70 du/ac; node: moderate 20-40 du/ac, aggressive: 20-50 du/ac; suburban: moderate 15 du/ac, aggressive: 30 du/ac.
Operational feasibility is an important factor in evaluating the rail alternatives. Each alternative has unique track and vehicle needs and will need to be integrated into the operations of existing transit and freight rail systems. In the Peninsula or West Bay the DRC alternatives will need to share the right-of-way and infrastructure used by Caltrain and also to be used by HSR. In the East Bay the DRC will operate on the same tracks used by the UPRR, ACE, and the Capitol Route trains. At some point the DRC may also connect directly to the Altamont Corridor HSR service. As a result the DRC project must employ a technology that is compatible with that currently in use or planned to be in use by all of these rail systems. In addition, the DRC project must provide adequate infrastructure to ensure its operations will not create conflicts and delays for the existing and future rail passenger and freight services in the East and West Bay.

Rail Technology Issues
A review of rail technologies was conducted as part of this study and concluded that any rail equipment that would be used on the DRC project would have to satisfy the Federal Rail Administration’s (FRA) requirements for mixed operations of freight and passenger trains (see Figure 2). This limits the technology to conventional commuter rail equipment, diesel locomotives and passenger cars such as those now used by Caltrain and ACE, or Diesel Multiple Units (DMUs). DMUs are self-propelled rail cars which can run alone or be coupled together. Marin and Sonoma County’s SMART rail project plans to use this type of vehicle.

Caltrain currently uses conventional commuter rail equipment. With the planned electrification project Caltrain will convert to Electric Multiple Units (EMUs) which are not compliant with the FRA’s requirements. In 2010 Caltrain received a waiver from the FRA which will allow it to operate a mix of compliant and non-compliant vehicles. As a result the technologies proposed for the DRC will be able to operate on the Caltrain infrastructure. At present it appears that the HSR rail service planned for the Peninsula corridor will be in its own exclusive right of way, physically separated from Caltrain and from the DRC project.

It is feasible to use FRA compliant EMU equipment on the DRC. This was ruled as being less desirable than the diesel equipment options due to the added cost of the electrification and the potential difficulty of obtaining approval from the UPRR to add the overhead wiring in the territory used by freight trains.

Operational Requirements
The Original Rail Project (R1) was purposely limited to one train per hour on each route in the peak direction only to limit conflicts with existing rail operations in both the West and East Bay. The project includes rail infrastructure improvement on both sides of the Bay to address these issues. Any alternative that increases the frequency of trains will increase the potential for operational conflicts. The Increased Service – Bi-Directional alternative (R2) creates additional conflicts with Caltrain services in the West Bay and the with UPRR, ACE and the Capitol Route trains in the East Bay, particularly on the track segment through Centerville that links the Niles Subdivision with the Coast Subdivision. This track segment is a bottleneck because virtually all the pas-
senger and freight trains must pass through this corridor. The Rail Shuttle Alternative (R3) avoids the conflicts with Caltrain services that are present in alternatives R1: Original Project and R2: Increased Service. However, because of the increased frequency of this alternative, it has greater conflicts with East Bay train operations than the original project. The same is true of alternative R4: Rail Shuttle – Shinn. Alternative R5: Original Project and Rail Shuttle is intended to maximize the amount of rail service provided while managing the degree of operational conflicts created. In the West Bay it has the same operational conflicts that the Original Project and in the East Bay it has more operational conflicts than the Original Project, but less than the full Rail Shuttle – Union City alternative (R3).

**EVALUATION SUMMARY OF RESULTS**

Based on the criteria outlined above, the following summary of results provides a comparative evaluation for the rail and bus alternatives.

**Rail Alternatives**

As shown in Table 7 below the Original Project performs well in terms of capital costs, TOD potential and cost-effectiveness. While ridership (new trips) is less than the other alternatives, its cost is also less, so that overall it is one of the best performing alternatives. The Increased Service – Bi-Directional alternative (R2) does well in terms of ridership and TOD potential, but it has relatively high cost and operational issues, and only fair cost-effectiveness. The Rail Shuttle – Union City alternative (R3) has high ridership potential, TOD potential and good cost-effectiveness, even though its costs are higher than the Original Project. It does have operational feasibility issues in the East Bay, but still is one of the best performing alternatives overall. The high costs of the Rail Shuttle – Shinn alternative (R4) due to the need for a new BART station negatively affects its overall performance and cost-effectiveness. Combining the Original Project with the Rail Shuttle (R5) results in a very versatile, cost effective project that is one of the best performing alternatives overall.

**Bus Alternatives**

Table 8 below provides a summary comparison of the bus alternatives, all of which performed reasonably well. The Original Bus TSM alternative (B1) had the least ridership, but also the lowest costs which re-

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5 An operational analysis of the bus alternatives was not conducted because buses can operate in mixed flow with regular traffic and do not have substantial operational issues.

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### Table 7: Evaluation of Rail Alternatives

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Ridership (New Trips)</th>
<th>Total Costs (Capital)</th>
<th>Cost Effectiveness</th>
<th>TOD Potential</th>
<th>Operational Feasibility</th>
<th>Best Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1: Original Project</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>✓</td>
</tr>
<tr>
<td>R2: Increase Service – Bi-Directional</td>
<td>● ● ●</td>
<td>● ● ●</td>
<td>● ● ●</td>
<td>● ●</td>
<td>● ●</td>
<td>● ●</td>
</tr>
<tr>
<td>R3: Rail Shuttle – Union City</td>
<td>● ●</td>
<td>●</td>
<td>●</td>
<td>● ●</td>
<td>● ●</td>
<td>● ●</td>
</tr>
<tr>
<td>R4: Rail Shuttle – Shinn</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>R5: Original Project + Rail Shuttle</td>
<td>● ●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

- ● = Worst
- ● ● = Below Average
- ● ● ● = Above Average
- ● ● ● ● = Best

### Table 8: Evaluation of Bus Alternatives

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Ridership</th>
<th>Total Costs</th>
<th>Cost Effectiveness</th>
<th>TOD Potential</th>
<th>Best Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1: Original Bus TSM</td>
<td>●</td>
<td>● ● ●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>B2: Enhanced Bus TSM</td>
<td>●</td>
<td>● ● ●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>B3: BRT - Bayfront Express Busway</td>
<td>● ●</td>
<td>● ● ●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>B4: BRT Shuttle - Union City to Redwood City</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>B5: Enhanced Bus TSM + BRT Shuttle</td>
<td>● ● ●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>✓</td>
</tr>
</tbody>
</table>
sulted in good cost-effectiveness. The added capital investment and route improvements included in the Enhanced Bus TSM alternative (B2) produced better ridership than the Original Bus TSM alternative (B1) and overall improved performance. The BRT Bayfront Express Busway alternative (B3) involves much higher costs than the other options and did not produce substantially more ridership. As a result it had the worst cost-effectiveness. The BRT Shuttle alternative performed well in all categories even though it has higher costs than the Original TSM Bus Alternative. The best performing alternative combines the best features of the Enhanced Bus TSM alternative with the BRT Shuttle alternative. This option produces high ridership at relatively low cost. The alternatives with BRT characteristics tend to have more infrastructure improvement and related investment with corresponding development characteristics and were therefore rated higher for TOD potential than TSM.
EIS/EIR ALTERNATIVES TO BE STUDIED

Based on the alternatives evaluation described in the previous section, the following set of alternatives are recommended for study in the EIR/EIS.

- No Build;
- Original Project (Rail);
- Rail Shuttle - Union City (Rail) (see Map 2);
- Original Project + Rail Shuttle (Rail) (see Map 3); and
- Enhanced Bus TSM + BRT Shuttle (Bus) (see Map 4).

FUNDING STRATEGY

The success in funding large infrastructure projects such as DRC relies on political will and leadership, stakeholder support, project readiness, seizing opportunities and patience. Currently, there are $345 million in commitments from seven different sources. Local sources include local sales taxes in Alameda, San Mateo and Santa Clara counties, and bridge tolls. State sources include ITIP and RTIP. VTA’s sales tax commitment of $44 million described in the Santa Clara Measure A ballot initiative (in 2000) and in the 2035 VTP (January 2009). However, this source of funds is no longer committed in VTA’s 10 year SRTP. ITIP funds are committed to the project in Resolution 3434. However, this source of funds is subject to state budget approval and may be at risk. RTIP funds are committed as a result of a swap of RM2 funds for future Alameda County RTIP funds. However, this source of funds is subject to state budget approval and may be at risk. Given the status of the state budget, RTIP funds are unlikely to be available for several years.

A $400+ million funding gap exists for the rail DRC alternatives. There are several new opportunities for funding, including:

- MTC’s Transit Sustainability Project. Funding for transit in the region and the possible expansion of bridge tolls.
- Alameda Countywide Transportation Plan. Provides funding for all transportation modes and will consider a new sales tax measure and expenditure plan.
- Federal Transportation Bill. Reauthorization will outline federal funding for the next five years, which the DRC may be able to compete for in the future.

See Appendix E for additional information regarding the funding strategy.

NEXT STEPS

In order to move forward with DRC planning and implementation, the following initial steps were discussed with the PAC. In November of 2010 the PAC (after approvals from the both the PDT and CAP) gave the project team direction to proceed with the following:

- Proceed with planning, design and environmental studies, including preparation of EIR/EIS.
- Secure additional funding sources and prepare full funding plan.
- Complete 15% design.

It was noted that although the project is included in the Resolution 3434 list of regional projects, it is currently ranked in tier 4. It is clear that in order to compete with the host of other projects in the Bay Region, this project will need the full support of its funding partners and the rest of the region to advance to implementation.
MAP 2 Alternative R3: Rail Shuttle - Union City

- Dumbarton Rail Route and Stations
- Caltrain Alignment and Stations
- BART Alignment and Stations
- Other Rail Corridors and Stations
Appendix A: Ridership Analysis
# VTA Ridership Projections to the Year 2035

## Daily Boardings

<table>
<thead>
<tr>
<th>Alternatives</th>
<th>2005 ABAG</th>
<th>2009 ABAG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rail: Original Project (R1)</td>
<td>Rail: Original Project (R1)</td>
</tr>
<tr>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Bay</td>
<td>912</td>
<td>1771</td>
</tr>
<tr>
<td>East Bay</td>
<td>384</td>
<td>62</td>
</tr>
<tr>
<td>Total Local</td>
<td>1296</td>
<td>1833</td>
</tr>
<tr>
<td>% Local</td>
<td>22%</td>
<td>21%</td>
</tr>
<tr>
<td>Transbay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Bay to East Bay</td>
<td>2309</td>
<td>3380</td>
</tr>
<tr>
<td>East Bay to West Bay</td>
<td>2309</td>
<td>1487</td>
</tr>
<tr>
<td>Total East Bay to West Bay</td>
<td>2309</td>
<td>711</td>
</tr>
<tr>
<td>Total Transbay</td>
<td>4618</td>
<td>6760</td>
</tr>
<tr>
<td>%Transbay</td>
<td>78%</td>
<td>79%</td>
</tr>
<tr>
<td>Total Boardings</td>
<td>5914</td>
<td>8593</td>
</tr>
</tbody>
</table>

## Peak Boardings

<table>
<thead>
<tr>
<th>Alternatives</th>
<th>2005 ABAG</th>
<th>2009 ABAG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rail: Original Project (R1)</td>
<td>Rail: Original Project (R1)</td>
</tr>
<tr>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Bay</td>
<td>912</td>
<td>1771</td>
</tr>
<tr>
<td>East Bay</td>
<td>384</td>
<td>62</td>
</tr>
<tr>
<td>Total Local</td>
<td>1296</td>
<td>1833</td>
</tr>
<tr>
<td>% Local</td>
<td>22%</td>
<td>21%</td>
</tr>
<tr>
<td>Transbay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Bay to East Bay</td>
<td>2309</td>
<td>3380</td>
</tr>
<tr>
<td>East Bay to West Bay</td>
<td>2309</td>
<td>1487</td>
</tr>
<tr>
<td>Total East Bay to West Bay</td>
<td>2309</td>
<td>711</td>
</tr>
<tr>
<td>Total Transbay</td>
<td>4618</td>
<td>6760</td>
</tr>
<tr>
<td>%Transbay</td>
<td>78%</td>
<td>79%</td>
</tr>
<tr>
<td>Total Boardings</td>
<td>5914</td>
<td>8593</td>
</tr>
</tbody>
</table>

## Off Peak Boardings

<table>
<thead>
<tr>
<th>Alternatives</th>
<th>2005 ABAG</th>
<th>2009 ABAG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rail: Original Project (R1)</td>
<td>Rail: Original Project (R1)</td>
</tr>
<tr>
<td>Local</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Bay</td>
<td>- -</td>
<td>234</td>
</tr>
<tr>
<td>East Bay</td>
<td>- -</td>
<td>13</td>
</tr>
<tr>
<td>Total Local</td>
<td>- -</td>
<td>247</td>
</tr>
<tr>
<td>% Local</td>
<td>0%</td>
<td>40%</td>
</tr>
<tr>
<td>Transbay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Bay to East Bay</td>
<td>- -</td>
<td>190</td>
</tr>
<tr>
<td>East Bay to West Bay</td>
<td>- -</td>
<td>0</td>
</tr>
<tr>
<td>Total East Bay to West Bay</td>
<td>- -</td>
<td>49</td>
</tr>
<tr>
<td>Total Transbay</td>
<td>- -</td>
<td>380</td>
</tr>
<tr>
<td>%Transbay</td>
<td>0%</td>
<td>61%</td>
</tr>
<tr>
<td>Total Boardings</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: The VTA model was used to develop forecasts for the original rail project, the increased service alternative, the Union City rail shuttle, and the extended rail service concept to Livermore. The consultant team used these ridership estimates to develop ridership numbers for all of the alternatives considered. This process was also used for the bus alternatives.
Appendix B: Capital, Operating and Maintenance Costs
### Summary of Operating and Maintenance Costs for Rail Alternatives

<table>
<thead>
<tr>
<th>Original Project - (R1)</th>
<th>End Points</th>
<th>Miles</th>
<th>Frequency</th>
<th>Trips/Day</th>
<th>Train Miles/Day</th>
<th>Cost/Train Mile (1)</th>
<th>Cost/Day</th>
<th>Days</th>
<th>Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak period (3 hours AM, 3 hours PM)</td>
<td>Union City to San Francisco</td>
<td>43.62</td>
<td>1 hour peak</td>
<td>6</td>
<td>261.72</td>
<td>$ 59.04</td>
<td>$ 15,451.95</td>
<td>250</td>
<td>$ 3,862,987</td>
</tr>
<tr>
<td>Peak direction only</td>
<td>Union City to San Jose</td>
<td>38.03</td>
<td>1 hour peak</td>
<td>6</td>
<td>228.18</td>
<td>$ 59.04</td>
<td>$ 13,751.75</td>
<td>250</td>
<td>$ 3,375,937</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>7,230,924</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Increased Service - Bi-directional (R2)</th>
<th>End Points</th>
<th>Miles</th>
<th>Frequency</th>
<th>Trips/Day</th>
<th>Train Miles/Day</th>
<th>Cost/Train Mile (1)</th>
<th>Cost/Day</th>
<th>Days</th>
<th>Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak period (3 hours AM, 3 hours PM)</td>
<td>Union City to San Francisco</td>
<td>43.62</td>
<td>1/2 hour peak</td>
<td>12</td>
<td>523.44</td>
<td>$ 59.04</td>
<td>$ 30,900.90</td>
<td>250</td>
<td>$ 7,725,974</td>
</tr>
<tr>
<td>Peak direction</td>
<td>Union City to San Jose</td>
<td>38.03</td>
<td>1/2 hour peak</td>
<td>12</td>
<td>456.36</td>
<td>$ 59.04</td>
<td>$ 26,943.49</td>
<td>250</td>
<td>$ 6,735,874</td>
</tr>
<tr>
<td>Bi-directional off-peak shuttle to Redwood City (10 hours)</td>
<td>Union City to Redwood City</td>
<td>20.90</td>
<td>1/2 hour off-peak</td>
<td>40</td>
<td>836.00</td>
<td>$ 59.04</td>
<td>$ 49,937.44</td>
<td>250</td>
<td>$ 12,339,360</td>
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<td><strong>Total</strong></td>
<td><strong>64</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td><strong>26,803,208</strong></td>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Increase Service - South Only</th>
<th>End Points</th>
<th>Miles</th>
<th>Frequency</th>
<th>Trips/Day</th>
<th>Train Miles/Day</th>
<th>Cost/Train Mile (1)</th>
<th>Cost/Day</th>
<th>Days</th>
<th>Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak period (3 hours AM, 3 hours PM)</td>
<td>Union City to Mountain View</td>
<td>31.60</td>
<td>1/2 hour peak</td>
<td>12</td>
<td>379.20</td>
<td>$ 59.04</td>
<td>$ 22,387.97</td>
<td>250</td>
<td>$ 5,596,992</td>
</tr>
<tr>
<td>Peak direction</td>
<td>Union City to Menlo Park</td>
<td>24.40</td>
<td>1/2 hour off-peak</td>
<td>40</td>
<td>976.00</td>
<td>$ 59.04</td>
<td>$ 57,623.04</td>
<td>250</td>
<td>$ 14,405,760</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>52</strong></td>
<td></td>
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<td></td>
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<td><strong>20,002,752</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Rail Shuttle - Union City - 15 minute</th>
<th>End Points</th>
<th>Miles</th>
<th>Frequency</th>
<th>Trips/Day</th>
<th>Train Miles/Day</th>
<th>Cost/Train Mile (1)</th>
<th>Cost/Day</th>
<th>Days</th>
<th>Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi-directional all-day service (16 hours)</td>
<td>Union City to Redwood City</td>
<td>21.90</td>
<td>1/4 hour all-day</td>
<td>128</td>
<td>2,803.20</td>
<td>$ 59.04</td>
<td>$ 165,500.93</td>
<td>250</td>
<td>$ 41,375,232</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>7,230,924</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rail Shuttle - Union City - 15 minute (R3)</th>
<th>End Points</th>
<th>Miles</th>
<th>Frequency</th>
<th>Trips/Day</th>
<th>Train Miles/Day</th>
<th>Cost/Train Mile (1)</th>
<th>Cost/Day</th>
<th>Days</th>
<th>Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi-directional peak service (3 hours AM, 3 hours PM)</td>
<td>Union City to Redwood City</td>
<td>21.90</td>
<td>1/4 hour peak</td>
<td>48</td>
<td>1,051.20</td>
<td>$ 59.04</td>
<td>$ 62,062.85</td>
<td>250</td>
<td>$ 15,515,712</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>7,230,924</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rail Shuttle - Union City - 30 minute</th>
<th>End Points</th>
<th>Miles</th>
<th>Frequency</th>
<th>Trips/Day</th>
<th>Train Miles/Day</th>
<th>Cost/Train Mile (1)</th>
<th>Cost/Day</th>
<th>Days</th>
<th>Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi-directional all-day service (16 hours)</td>
<td>Union City to Redwood City</td>
<td>21.90</td>
<td>1/2 hour all-day</td>
<td>64</td>
<td>1,401.60</td>
<td>$ 59.04</td>
<td>$ 82,750.46</td>
<td>250</td>
<td>$ 20,687,616</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>7,230,924</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rail Shuttle - Shinn (R4)</th>
<th>End Points</th>
<th>Miles</th>
<th>Frequency</th>
<th>Trips/Day</th>
<th>Train Miles/Day</th>
<th>Cost/Train Mile (1)</th>
<th>Cost/Day</th>
<th>Days</th>
<th>Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi-directional all-day service (16 hours)</td>
<td>Shinn to Redwood City</td>
<td>15.80</td>
<td>1/4 hour all-day</td>
<td>128</td>
<td>2,022.40</td>
<td>$ 59.04</td>
<td>$ 119,432.50</td>
<td>250</td>
<td>$ 29,850,624</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>7,230,924</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Original Project and Rail Shuttle – Union City (R5)</th>
<th>End Points</th>
<th>Miles</th>
<th>Frequency</th>
<th>Trips/Day</th>
<th>Train Miles/Day</th>
<th>Cost/Train Mile (1)</th>
<th>Cost/Day</th>
<th>Days</th>
<th>Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak period (3 hours AM, 3 hours PM)</td>
<td>Union City to San Francisco</td>
<td>43.62</td>
<td>1/2 hour peak</td>
<td>24</td>
<td>525.60</td>
<td>$ 59.04</td>
<td>$ 31,031.42</td>
<td>250</td>
<td>$ 7,757,836</td>
</tr>
<tr>
<td>Peak direction only</td>
<td>Union City to San Jose</td>
<td>38.03</td>
<td>1 hour peak</td>
<td>6</td>
<td>261.72</td>
<td>$ 59.04</td>
<td>$ 15,451.95</td>
<td>250</td>
<td>$ 3,862,987</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>44</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>14,872,176</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: 1. Cost per train mile excludes administrative, trainset lease and capital maintenance fund expenditures, or $55.65 per train mile in 2008 dollars escalated to 2010 at 3 percent per year.
## Summary of Capital Costs for Rail Alternatives

<table>
<thead>
<tr>
<th>Rail Alternatives</th>
<th>Capital Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Facilities</td>
</tr>
<tr>
<td>Original Project - (R1)</td>
<td>$ 632</td>
</tr>
<tr>
<td>Peak period (3 hours AM, 3 hours PM)</td>
<td></td>
</tr>
<tr>
<td>Peak direction only</td>
<td></td>
</tr>
<tr>
<td>Increased Service - Bi-directional (R2)</td>
<td>$ 712</td>
</tr>
<tr>
<td>Peak period (3 hours AM, 3 hours PM)</td>
<td></td>
</tr>
<tr>
<td>Peak direction</td>
<td></td>
</tr>
<tr>
<td>Bi-directional off-peak shuttle to Redwood City (10 hours)</td>
<td></td>
</tr>
<tr>
<td>Increase Service - South Only</td>
<td>$ 692</td>
</tr>
<tr>
<td>Peak period (3 hours AM, 3 hours PM)</td>
<td></td>
</tr>
<tr>
<td>Peak direction</td>
<td></td>
</tr>
<tr>
<td>Bi-directional off-peak shuttle to Menlo Park (10 hours)</td>
<td></td>
</tr>
<tr>
<td>Rail Shuttle - Union City - 15 minute</td>
<td>$ 722</td>
</tr>
<tr>
<td>Bi-directional all-day service (16 hours)</td>
<td></td>
</tr>
<tr>
<td>Rail Shuttle - Union City - 15 minute (R3)</td>
<td>$ 722</td>
</tr>
<tr>
<td>Bi-directional peak service (3 hours AM, 3 hours PM)</td>
<td></td>
</tr>
<tr>
<td>Rail Shuttle - Union City - 30 minute</td>
<td>$ 662</td>
</tr>
<tr>
<td>Bi-directional all-day service (16 hours)</td>
<td></td>
</tr>
<tr>
<td>Less frequent service</td>
<td></td>
</tr>
<tr>
<td>Rail Shuttle - Shinn (R4)</td>
<td>$ 822</td>
</tr>
<tr>
<td>Bi-directional all-day service (16 hours)</td>
<td></td>
</tr>
<tr>
<td>New BART station at Shinn</td>
<td></td>
</tr>
<tr>
<td>Extended Service - Livermore (Super ACE/HSR) to Redwood City</td>
<td>$ 762</td>
</tr>
<tr>
<td>Bi-directional peak period (3 hours AM, 3 hours PM)</td>
<td></td>
</tr>
<tr>
<td>Bi-directional off-peak service (10 hours)</td>
<td></td>
</tr>
<tr>
<td>Extended Service - Warm Springs (Super ACE/HSR) to Redwood City</td>
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## Summary of Capital Cost for Trainsets Required Per Rail Alternative

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<th>End Points</th>
<th>Miles</th>
<th>Frequency</th>
<th>Trips/Day</th>
<th>Trainsets Required</th>
<th>Costs ($ Millions)</th>
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</tr>
<tr>
<td>Union City to San Francisco</td>
<td>43.62</td>
<td>1 hour peak</td>
<td>6</td>
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<td>Peak direction</td>
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<td>1/2 hour peak</td>
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<td>21.90</td>
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<td>1 hour peak</td>
<td>6</td>
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1. Spare sets included
Appendix C: Cost Effectiveness Analysis
### Cost Effectiveness Analysis of Alternatives

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<th>Rail Alternatives</th>
<th>Capital Costs</th>
<th>O&amp;M Costs</th>
<th>Annualized Costs</th>
<th>Daily Ridership</th>
<th>C/E Index</th>
<th>C/E Scale (out of 10)</th>
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<td>Vehicles</td>
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<td>Boardings</td>
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<tr>
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<td>$94</td>
<td>$816</td>
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<td>Extended Service - Warm Springs (Super ACE/HSR) to Redwood City</td>
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</table>

### Notes:  
1. Rail Alternatives are indexed against rail alternatives only; Ridership is annualized (multiplied by 250). C/E Index = Annualized Cost * (New Trips *250  
2. C/E Scale = 1 - (C/E Index - C/E Index MAX of all alts) / (C/E Index MAX of all alts - C/E Index MIN of all alts) * 10  
3. Bus Alternatives are indexed against rail alternatives only; Ridership is annualized (multiplied by 250). C/E Index = Annualized Cost * (New Trips *250  
4. C/E Scale = 1 - (C/E Index - C/E Index MIN of all alts) / (C/E Index MAX of all alts - C/E Index MIN of all alts) * 10
Appendix D: Land Use Analysis
MEMORANDUM

DATE November 12, 2010
TO Bill Hurrell
Wilbur Smith Associates
FROM Alexis Lynch
RE Land Use Evaluation for the Dumbarton Rail Corridor Project

This memorandum describes the purpose, methodology, and results of the land use evaluation conducted by Design, Community & Environment (DC&E) for Wilbur Smith Associates (WSA) for the Dumbarton Rail Corridor Project.

A. Purpose

The purpose of the land use evaluation is to identify opportunities for new development in proximity to potential transit stations along the Dumbarton Rail Corridor, as a means to provide WSA with future buildout numbers that might be used in Dumbarton ridership modeling but are not accounted for in the existing travel demand model for the Dumbarton Rail Corridor Project. The goal is to find opportunities for transit-oriented development (TOD) that are not captured in the existing model results, to boost the ridership potential of future Dumbarton rail service.

B. Methodology

To complete this task, DC&E relied upon data provided by the Valley Transit Authority (VTA). The VTA data includes Association of Bay Area Governments (ABAG) estimates of existing households in 2005, as well as ABAG Projections 2009 household data for 2035 in traffic analysis zones (TAZ) within a ½-mile radius of the station areas. For each station area, total households in 2005 are compared to total projected households in 2035, in order to yield the net change projected by ABAG. DC&E then compared the buildout potential of various TOD plans and projects in the station areas to this projected net change. In this way, the amount of development estimated to occur beyond that projected by ABAG was determined.

Although ABAG projections use households as the unit of measurement, the numbers obtained through this land use evaluation are based on housing units. The ratio of housing units to households in the Bay Area varies by City, but is typically close to 1.0. Therefore,
although “households” and “housing units” are not synonymous terms, the units are assumed in this memorandum to be equivalent for the purposes of this evaluation.

Many of the station areas are existing Altamont Corridor Express (ACE), BART, or Caltrain stations. Station areas are shown in Figure 1.

Table 1 shows the findings of the land use evaluation.

1. **Existing Plans and Policies**

As a first step, DC&E reviewed regional and local planning documents (including General Plans and Specific Plans) to determine policy support for TOD and station area buildout potential. DC&E also contacted local planning staff to identify specific pipeline projects in stations areas and other opportunities for TOD. DC&E’s work experience also served as a source of information, given DC&E’s recent and ongoing work in several of the station areas. This evaluation is based on station area development capacities estimated for planning purposes, and is not based on market studies. Given the current economic climate, it is likely that these buildout numbers could not be fully attained by 2035.

The findings of this first step of the evaluation are based on the following research in each station area:

* **East Palo Alto/Menlo Park Dumbarton Rail Station.** DC&E staff preparing the Ravenswood Specific Plan for the City of East Palo Alto provided information on planning efforts in this area. DC&E also reviewed the City of East Palo Alto’s 2009 Draft Housing Element.

* **Downtown Menlo Park.** DC&E staff who prepared the El Camino Real/Downtown Vision Plan for the City of Menlo Park provided information on Downtown Menlo Park. The El Camino Real/Downtown Specific Plan, currently in preparation, also served as a source of information.

* **Fremont.** DC&E contacted City staff and reviewed the City’s Fremont Housing Element (2007-1014), adopted in July 2009; 12 Guiding Principles, adopted in May 2010; and General Plan Update 2035, currently in preparation.

  * **Centerville.** The Centerville Specific Plan served as an additional source of information for the Centerville station area.

  * **Warm Springs.** DC&E reviewed City documents regarding the Warm Springs Specific Plan, currently on hold, as well as various public documents regarding the recent closure and repurchase of the NUMMI auto manufacturing plant and TOD policy direction in the City.

* **Livermore.** DC&E is working for the Bay Area Rapid Transit District (BART) on the BART to Livermore Extension Program. DC&E also reviewed the City’s Draft 2009 Housing Element, currently in preparation, and the City’s 2008-2010 Housing Implementation Program.

  * **Downtown.** The City’s 2004 Downtown Livermore Specific Plan served as an additional source of information for Downtown Livermore.

  * **Vasco Road.** The City’s 2007 Brisa Neighborhood Plan served as an additional source of information for the Vasco Road station area.
♦ Newark. DC&E prepared the Newark Area Two Concept Plan for the City of Newark. DC&E also contacted City staff and reviewed the City’s ongoing Dumbarton TOD Specific Plan and Draft 2009 Housing Element.

♦ North Fair Oaks. DC&E reviewed documents associated with the County’s North Fair Oaks Community Plan planning process. DC&E staff working in San Mateo County also served as a source of information.

♦ Redwood City. DC&E reviewed San Mateo County Transit-Oriented Development Opportunity Study and the City’s Draft Housing Element and Downtown Precise Plan.

♦ Union City. DC&E contacted City staff, and also reviewed the City’s 2002 General Plan and Intermodal Station District and Transit Facility Plan.

2. Potential Future TOD
At the request of the Project Team, DC&E conducted an additional land use evaluation for the Dumbarton Rail Corridor Project. For this evaluation, DC&E assigned both “moderate” and “aggressive” development intensities for each station area type and applied these development intensities to lands within each station area that could reasonably be assumed to be developed at a higher density.

DC&E’s assumptions regarding “moderate” and “aggressive” densities were informed by the setting in which each station area is located, i.e. whether it is a “downtown,” “node,” or “suburban” station area. The classification of each station area and the densities assumed in the “moderate” and “aggressive” approaches are listed below:

♦ Downtowns: Moderate = 30 to 60 housing units per acre (du/ac); Aggressive = 50 to 70 du/ac
  • Downtown Menlo Park
  • Downtown Livermore
  • Redwood City

♦ Nodes: Moderate = 20 to 40 du/ac; Aggressive = 20 to 50 du/ac
  • East Palo Alto/Menlo Park
  • Fremont – Centerville
  • Newark
  • North Fair Oaks
  • Fremont – Warm Springs
  • Union City

♦ Suburbs: Moderate = 15 du/ac; Aggressive = 30 du/ac
  • Livermore – Vasco Road
# Summary of Results

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<th>2035 Adjusted Projection (Existing Plans and Policies)</th>
<th>2035 Adjusted Projection (Moderate Approach)</th>
<th>2035 Adjusted Projection (Aggressive Approach)</th>
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Notes:
1. Existing household data was obtained from VTA. Existing household data is based on ABAG data for 2005, as adjusted by VTA to correspond to the station areas.
2. 2035 Projection refers to the number of households projected to exist in the station areas according to ABAG Projections 2005.
3. "Additional Housing Units under Existing Plans and Policies" refers to the number of additional housing units estimated to be located in the station area by 2035, based on existing policies and plans.
4. "Potential Future TOD (Moderate Approach)" refers to the number of additional housing units estimated to be located in the station area by 2035, based on an assumption that land in the station area would be re-designated to allow residential densities higher than those allowed under existing policies and plans. Densities assumed for each station area under the moderate approach are stated in the following notes. Note: TOD = transit-oriented development.
5. "Potential Future TOD (Aggressive Approach)" refers to the number of additional housing units estimated to be located in the station area by 2035, based on an assumption that land in the station area would be re-designated to allow residential densities higher than those assumed under the moderate approach. Densities assumed for each station area under the aggressive approach are stated in the following notes.
6. "2035 Adjusted Projection (Existing Plans and Policies)" is the sum of the 2035 ABAG projection and the additional housing units allowed existing plans and policies.
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"2035 Adjusted Projection (Moderate Approach)" is the sum of the 2035 ABAG projection, additional housing units allowed existing plans and policies, and potential future TOD under a moderate approach.

"2035 Adjusted Projection (Aggressive Approach)" is the sum of the 2035 ABAG projection, additional housing units allowed existing plans and policies, and potential future TOD under an aggressive approach.

**EAST PALO ALTO/MENLO PARK**

1. New development in proximity to the East Palo Alto station area can be expected under the Ravenswood Specific Plan. However, the Plan Area is outside of the station area and therefore has not been taken into consideration. New development in this area could also occur in the City of Menlo Park, but the City has stated that it is only interested in employment-generating development.

2. Assumes that 68.5 acres of lands designated as Limited Industry under the Menlo Park General Plan would be developed at a density of 40 du/ac. Please note that this goes against the City's statement that it is only interested in employment-generating development.

**DOWNTOWN MENLO PARK**

2. The City's evolving downtown plan includes a total of 680 new units in the Plan Area. The Plan includes 48 acres along El Camino Real and Santa Cruz Avenue to be developed at a density of 60 du/ac, and 48 acres of land designated as Public Facility to be developed at 70 du/ac. These densities are largely consistent with the densities allowed under the El Camino Real/Downtown Specific Plan.

**FREMONT--CENTREVILLE**

3. This estimate does not account for the likely redesignation of land uses near the Centerville station to promote higher densities, as allowed under recent City land use policy.

4. Assumes the redesignation of 9 acres of land near the Centerville station from Medium Density Residential (10 du/ac) to residential land use at 50 du/ac; and 77 acres of Commercial land use to residential land use, at 50 du/ac.

5. Assumes the redesignation of 10 acres of lands designated Medium Density Residential and Medium High Density Residential to residential land use, at 50 du/ac; and that 10 acres of lands designated as High Density Residential are built at 50 du/ac rather than 17.5 du/ac.

6. Assumes that residential units built at a density of 20 du/ac are constructed on upper stories above 9.5 acres of Neighborhood Precise Plan area, at a 30 percent redevelopment rate. Assumes 38 acres of General Industrial and General Commercial uses along Middlefield Road in downtown, which would be redeveloped as multi-family residential and used up an maximum allowable density of 40 du/ac; and redesignation of 36 acres of commercial land use to multi-family residential land use with a maximum allowable density of 40 du/ac.

**DOWNTOWN LIVERMORE**

5. Land use evaluation results indicate that 1,060 to 1,260 additional housing units could be expected; the higher end of this range is shown in this table.

6. Assumes the following land use density increases within the Downtown Livermore Specific Plan area: 40 acres of residential land from 30 du/ac to 50 du/ac; and 64 acres of residential land from 24 du/ac to 50 du/ac.

**LIVERMORE--VASCO ROAD**

6. Assumes that ABAG projections do not account for the 650-unit capacity of the Brisa Neighborhood Plan, and an additional 800 units associated with Program 1.1.1 density increases.

7. Assumes that the maximum housing allowed under the Downtown Precise Plan is increased to permit approximately 30 du/ac.

8. Assumes that the maximum housing allowed under the Downtown Precise Plan is increased to permit approximately 50 du/ac.

**INTERMODAL STATION DISTRICT AND TRANSIT FACILITY PLAN**

9. Assumes that the maximum housing allowed under the Intermodal Station District and Transit Facility Plan is increased to permit approximately 30 du/ac.

10. Assumes that the maximum housing allowed under the Intermodal Station District and Transit Facility Plan is increased to permit approximately 50 du/ac.
C. Results

DC&E’s research shows a variety of levels of TOD potential in the station areas evaluated, ranging from opposition to TOD to strong support for station area planning and development. Regional support under the ABAG’s FOCUS Program offers a strong indication of potential TOD. Through ABAG’s FOCUS Program, ABAG identifies Priority Development Areas (PDAs) and provides incentives to local governments that have shown commitment to more compact land use patterns in areas served by transit. ABAG defines PDAs as “locally-identified, infill development opportunity areas within existing communities. These are generally areas of at least 100 acres where there is local commitment to developing more housing along with amenities and services to meet the day-to-day needs of residents in a pedestrian-friendly environment served by transit. To be eligible to become a PDA, an area had to be within an existing community, near existing or planned fixed transit or served by comparable bus service, and planned for more housing.” Because commitment to TOD and land availability are required for an area to be identified as a PDA, PDAs seem to be a strong indicator of both feasibility and political support.

The sections below describe the results of DC&E’s research for each of the station areas. Each section compares the station area’s existing number of households to ABAG 2035 projections, outlines regional support for TOD within the station area, identifies opportunities for additional transit-oriented housing above ABAG projections under existing plans and policies. Finally, a "moderate" and "aggressive" estimate of additional potential future TOD is provided for each station area.

1. East Palo Alto/Menlo Park Dumbarton Rail Station

The Cities of East Palo Alto and Menlo Park are located on the western side of the San Francisco Bay, where the Dumbarton Bridge meets the Peninsula. Neither of the cities currently contains a rail station in this area, and it is expected that a Dumbarton Corridor station would occur in one city or the other, but not both. As a result, the two cities are competing as potential station locations. The City of Menlo Park has stated that it is only interested in hosting a new station in the selected location if it were primarily centered on jobs instead of housing. Therefore, it is assumed that, under existing plans and policies, any new residential TOD associated with future Dumbarton rail service in this area would be located in East Palo Alto rather than in Menlo Park.

The East Palo Alto station area is located near the Ravenswood district of East Palo Alto, immediately northwest of the intersection of Highway 101 and Willow Road/State Highway 114. According to ABAG, the ½-mile East Palo Alto station area contained approximately 1,760 households in 2005, and will contain approximately 2,660 households in 2035, for a projected increase of 900 households. A rail station located in East Palo Alto could have a catalytic effect on land use intensity and redevelopment because the City hopes to base its revitalization strategy on the creation of a Dumbarton rail station near University Avenue. However, although there are ongoing TOD plans in the city as a whole, there are no existing policy or planning initiatives directly associated with the ½-mile station area that

would increase its development potential or provide TOD opportunities beyond that reflected in ABAG projections. For example, the Ravenswood Specific Plan, currently under development, proposes re-designating significant areas of heavy industrial lands to mixed-use, residential, and office land uses, increasing the land available for additional TOD. Land use alternatives prepared as part of the planning process call for residential densities that would allow up to 1,200 future housing units in the 350-acre Plan Area. Yet the Plan Area for the Ravenswood Specific Plan lies 0.6 miles outside of the station area, outside the range of traditional TOD.

a. Regional Support for TOD
The East Palo Alto station area has been locally identified as a PDA under ABAG’s FOCUS Program. As such, the City seeks to implement policies that promote TOD in the station area and can apply for planning grants and infrastructure projects which promote compact, higher density development.

b. Opportunities for Additional TOD under Existing Plans and Policies
The City of East Palo Alto is currently developing its Ravenswood Specific Plan. However, as noted, the Plan Area is 0.6 miles from the boundary of the ½-mile East Palo Alto Station Area. As such, it cannot be seen as an opportunity for increased TOD within the station area.

c. Opportunities for Potential Future TOD
Additional potential future TOD could be achieved as described below. Please note that this growth would be against the City’s statement that it is only interested in employment-generating development in this area.

♦ Moderate Approach: 2,055 additional housing units could be built if 68.5 acres of lands designated as Limited Industry under the Menlo Park General Plan were converted to residential uses at a density of 30 du/ac. The resulting total number of housing units would be 4,715 units.

♦ Aggressive Approach: 3,425 additional housing units could be built if 68.5 acres of lands designated as Limited Industry under the Menlo Park General Plan were converted to residential uses at a density of 50 du/ac. The resulting total number of housing units would be 6,085 units.

d. Conclusion
As stated above, ABAG projects that the East Palo Alto station area will contain an additional 900 households by 2035. Under existing plans and policies, there are no opportunities for additional TOD that could be added to this projection. Under a moderate approach, an additional 2,055 housing units could be built, and under an aggressive approach an additional 3,425 housing units could be built.

2. Downtown Menlo Park
The Downtown Menlo Park station area is centered around an existing Caltrain station located in Downtown Menlo Park, at the intersection of West El Camino Real and
Ravenswood Avenue. According to ABAG, the ½-mile station area contained approximately 2,480 households in 2005, and will contain approximately 3,380 households in 2035, a projected increase of 900 households.

a. Regional Support for TOD
The El Camino Real Corridor and Downtown area is listed by ABAG as a PDA.

b. Opportunities for Additional TOD under Existing Plans and Policies
New development in Downtown Menlo Park would help to generate ridership for a station, but despite the availability of land the City has not expressed support for a station. The City’s evolving El Camino Real/Downtown Specific Plan foresees a total of 680 new units in the Plan Area, as compared to the 900 units projected by ABAG for the entire ½-mile station area, much of which is outside the Specific Plan Area.

c. Opportunities for Potential Future TOD
Additional potential future TOD could be achieved as described below. Please note that the El Camino Real/Downtown Specific Plan calls for mixed-use development, whereas this analysis assumes residential-only development. These figures do not include the 680 units that would be allowed under the Specific Plan.

♦ Moderate Approach: 2,020 additional housing units could be built if 48 acres along El Camino Real and Santa Cruz Avenue were developed at a density of 40 du/ac and 13 acres adjacent to the station were developed at a density of 60 du/ac. These densities are largely consistent with the densities allowed conditionally under the El Camino Real/Downtown Specific Plan. The resulting total number of housing units would be 5,400 units.

♦ Aggressive Approach: 3,260 additional housing units could be built if 48 acres along El Camino Real and Santa Cruz Avenue were developed at a density of 60 du/ac, 13 acres adjacent to the station were developed at a density of 70 du/ac, and 5 acres along Ravenswood Avenue were developed at a density of 30 du/ac. The resulting total number of housing units would be 6,640 units.

d. Conclusion
As stated above, ABAG projects that the Menlo Park station area will contain an additional 900 households by 2035. Under existing plans and policies, there are no opportunities for additional TOD that could be added to this projection. Under a moderate approach, an additional 2,020 housing units could be built, and under an aggressive approach an additional 3,260 housing units could be built.

3. Fremont – Centerville
The Centerville station area is centered around the existing Centerville Train Depot, which is an existing ACE station located at in northern Fremont, near the intersection of Fremont Boulevard and Central Avenue. According to ABAG, the ½-mile station area contained approximately 2,200 households in 2005, and will contain approximately 3,730 households in 2035, for a projected increase of 1,530 households.
ABAG projections do not fully capture future TOD capacity in and immediately adjacent to the Centerville station area. The station area contains both the majority of the Centerville Specific Plan (CSP) Plan Area and two large pockets of high-density residential land use. These areas will likely be developed at their maximum potential due to policy direction recently outlined as part of the City’s General Plan update process. These new policies establish TOD as the guiding model for growth in the city, and specifically identify the Centerville station area as a target for compact development.

a. Regional Support for TOD
Centerville has been identified by ABAG as a PDA.

b. Opportunities for Additional TOD under Existing Plans and Policies
The City’s existing CSP, amended March 2006, provides a foundation for TOD and compact land use patterns in the Centerville station area. Eleven of the 13 CSP sub-areas are located fully or partially within the station area, and these sub-areas have a residential buildout capacity of about 2,830 units. In addition, the Centerville station area contains two large pockets, totaling approximately 60 acres, of high-density residential land use that are outside the CSP Area. These have an additional combined residential capacity of approximately 1,650 units.

Current City of Fremont housing and land use policy direction is expected to ensure that the above TOD potential is fully realized. Evaluation of policies in the recently-adopted (July 14, 2009) Fremont Housing Element 2007-2014 reveals significant effort to promote transit-oriented, high-density development in Fremont. For example:

♦ Action 3.02-C: Redesignation of Land for Higher-Intensity Housing Construction: The City will continue to consider rezoning land for higher intensity (greater than 30 units/acre) development of both market rate and affordable housing as opportunities arise. The City will evaluate these possible conversions in accordance with the General Plan, taking into account the need to focus housing growth near transit.

♦ Policy 6.03: Focus future housing near transit nodes.

♦ Action 6.03-A: Update Land Use Element of General Plan: Consistent with regional planning efforts, the City plans to accommodate much of its future housing need in the Central Business District and in areas near existing and planned transit hubs (Centerville Train Depot, Fremont BART, Irvington BART) and along transit corridors.

Additionally, the City of Fremont General Plan Update 2035 is currently underway, and draft land use policies have been released. In accordance with Housing Element Action 6.03-A, above, these policies target transit-oriented, high-density development in Fremont, and specifically target compact development in around the Centerville train station. For example:

♦ Implementation LU-1.7A: TOD Locations: Focus the application of TOD development principles on the Fremont, Irvington, and Warm Springs BART Stations, the Centerville train station, and Midtown.
Implementation LU-1.7.B: Priority Development Areas: Focus Fremont’s future development during the next two decades within designated PDAs.

Implementation LU-1.7.D: Prohibition of New Low Intensity Uses in TOD Areas: New projects within ½ mile of the Centerville Train Station, the Fremont BART Station, and planned BART Stations should be designed so as not to preclude the long-term vision of these areas as higher intensity transit oriented development areas.

Policy LU-2.2: Opportunity Areas for Growth and Change: The primary growth areas include City Center, the areas within ½ mile of the Irvington and proposed South Fremont/Warm Springs BART station areas, and the area within ½ mile of the Centerville ACE station.

According to analysis recently performed by the City as part of the General Plan update process, approximately 80 percent of Fremont’s household growth between 2010 and 2035 will occur within ½ mile of an existing or planned BART station or the Centerville Train Depot.

c. Opportunities for Potential Future TOD

Additional potential future TOD could be achieved as described below.

Moderate Approach: 1,280 additional housing units could be built if 9 acres of land near the Centerville station were redesignated from Medium Density Residential (10 du/ac) to a higher allowable density (30 du/ac), 2.5 acres of public land were redesignated to residential land use at 30 du/ac, and 77 acres of Commercial land use were redesignated to a residential land use at 30 du/ac. These redesignations would be allowed under recently-drafted City land use policy. Note that this policy has not yet been adopted by the City of Fremont. The resulting total number of housing units would be 5,760 units.

Aggressive Approach: 3,470 additional housing units could be built if 9 acres of land near the Centerville station were redesignated from Medium Density Residential (10 du/ac) to a higher allowable density (50 du/ac), 2.5 acres of public land were redesignated to residential land use at 50 du/ac, and 77 acres of Commercial land use were redesignated to a residential land use at 50 du/ac. These redesignations would be allowed under recently-drafted City land use policy. Note that this policy has not yet been adopted by the City of Fremont. The resulting total number of housing units would be 7,950 units.

d. Conclusion

As stated above, ABAG projects that the Centerville station area will contain an additional 1,530 households by 2035, for a total of 3,730 households. This projection does not take into account that buildout of the CSP would allow for up to 2,830 housing units in and immediately surrounding the station area, and that the station area land use designations have a residential capacity of 1,650. Therefore, the station area currently has the capacity for up to 4,480 households by 2035, which would be 750 housing units above the ABAG projection.
Because the Centerville station area is associated with a PDA and contains an existing transit center, station area residential land may be targeted for zoning/land use conversion to higher densities under General Plan 2035 land use policies and, specifically, Housing Element 2007-2014 Action 3.02-C.

As noted above, the Centerville station area currently contains about 60 acres of land outside the CSP that is designated Residential High (up to 27 units per acre). This land has a total buildout capacity of 1,650 units. The City of Fremont’s Draft General Plan Update 2035 land use map identifies an Urban Residential land use designation, with an allowable density of 30 to 70+ units per acre.

Under a moderate approach, redesignations in the station area could allow for an additional 1,280 housing units. Under an aggressive approach, an additional 3,470 housing units could be built.

4. Fremont – Warm Springs

The Warm Springs station area includes the future Warm Springs BART station to be located immediately south of South Grimmer Road, between Interstate 680 and Fremont Boulevard. The majority of the eastern portion of the station area includes a large portion of the former NUMMI auto manufacturing plant property. According to ABAG, the station area contained approximately 110 households in 2005, and will contain approximately 120 households in 2035, a projected increase of ten households.

The ½-mile station area is designated primarily for industrial land use. As a result of current regional and local policy direction, TOD in the station area will likely lead to a greater number of future households than that projected by ABAG.

a. Regional Support for TOD

On February 23, 2010, Fremont’s City Council approved the staff recommendation to apply for a PDA designation for the Warm Springs BART station area. Formal designation by ABAG is pending.

b. Opportunities for Additional TOD under Existing Plans and Policies

Projecting future TOD capacity of the Warm Springs station area is difficult due to the fact that the City recently ceased development of the Warm Springs Specific Plan. Although the TOD and density-oriented objectives for the Warm Springs station area were established via City Council resolution in 2003 and land use alternatives established in 2007, the Plan has not been adopted. According to Dan Schoenholz, City of Fremont Policy and Special Projects Manager, the recent closure and sale of the NUMMI plant has delayed establishment of a detailed land use strategy for the Warm Springs station area, and the area is akin to a “study area donut hole” in the General Plan Update 2035 process.

However, the City recently received a $333,000 federal grant to study the revitalization of the area following closure of the NUMMI plant. According to the City, “The NUMMI Site Reuse and Revitalization Studies will provide technical information to guide future land use and economic actions on the reuse of the site. The anticipated area to be studied
encompasses approximately 850 gross acres. This study area includes the future Warm Springs BART Station and the potential for maximizing TOD around the station.”

On May 4, 2010, Fremont’s City Council adopted 12 Guiding Principles to articulate the City’s vision for the area to help guide the area’s future development. The guiding principles will inform the planning for the Warm Springs/South Fremont area, which includes the Warm Springs station area. Two of these principles specifically target TOD in the ½-mile station area and indicate that 2035 housing and population densities will exceed that indicated by ABAG projections:

♦ A variety of high density uses, which may include housing, high intensity commercial and employment centers, would be located within one-half mile of the Warm Springs BART Station, and could transition to include a broader range of commercial, industrial and community-serving uses beyond the one-half mile distance from BART.

♦ The area generally within one-half mile of the BART station should be designed as an active and vibrant urban center with integrated mixed-use communities that includes opportunities to live, work, and shop, supported by schools and public facilities located within convenient walking distance of BART.

Finally, as detailed above in the description of the Centerville station area evaluation, both the recently adopted Fremont Housing Element 2007-2014 and pending General Plan Update 2035 target transit-oriented, high-density development in Fremont, and will ultimately increase the TOD potential of all station areas in the city.

Although the City clearly seeks to promote increased TOD around the future BART station and the policy direction outlined above may result in future station area development intensity that exceeds ABAG projections, no plan for this development has been adopted or formally established in draft form. Thus, it would speculative at this point to quantify a potential increase in housing units over ABAG projections.

c. Opportunities for Potential Future TOD

Additional potential future TOD could be achieved as described below.

♦ Moderate Approach: 3,340 additional housing units could be built if 23 acres of land designated as Public Facility and 144 acres of various industrial uses were designated for multi-family residential housing at a density of 20 du/ac. The resulting total number of housing units would be 3,460 units.

♦ Aggressive Approach: 8,680 additional housing units could be built if 23 acres of land designated as Public Facility and 194 acres of various industrial uses were designated for multi-family residential housing at a density of 40 du/ac. This assumes that a portion of the NUMMI site would be redeveloped with housing. The resulting total number of housing units would be 8,800 units.

d. Conclusion

As stated above, ABAG projects that the Warm Springs station area will contain an additional ten households by 2035. This low projection is not surprising, given that the
prevailing industrial land use designation and the presence of the former NUMMI plant in
the station area are significant constraints to the intensification of residential and commercial
development. Under existing plans and policies, it is not expect that additional housing
would be built in the station area. Under a moderate approach, 3,340 housing units could
be developed. Under an aggressive approach, 8,680 housing units could be developed by
redeveloping a portion of the NUMMI site with housing and building to higher densities.  

5. Downtown Livermore

The Downtown Livermore station area is centered on the existing Livermore Transit
Center/Livermore ACE station, located just east of Livermore Avenue and north of First
Street. According to ABAG, the ½-mile station area contained approximately 1,420
households in 2005, and will contain approximately 2,160 households in 2035, a projected
increase of 740 households. This projection does not fully capture future TOD capacity in
Downtown Livermore station area resulting from recent City and BART-related policy
milestones.

a. Regional Support for TOD

Downtown Livermore is identified by ABAG as a PDA.

b. Opportunities for Additional TOD under Existing Plans and Policies

A large portion of Livermore’s growth is expected to occur in the City’s Downtown, the
result of the City’s transit-oriented, high density, 272-acre 2004 Downtown Livermore Specific
Plan (DTSP). The majority of the DTSP Area is located in the station area.

The DTSP has a maximum build-out scenario of 3,300 dwelling units, 855,000 square feet
of commercial space, and 217,000 square feet of office space. This potential will be fully
realized and likely exceeded by 2035. According to a City housing sites inventory recently
conducted as part of the City’s Draft 2007-2014 Housing Element, the DTSP Area has a
remaining capacity of 1,300 units. However, the Draft 2009 Housing Element also contains
policy to increase that capacity:

♦ Program 1.1.1, Residential Sites Inventory: This program identifies the Downtown
Neighborhood North Side Plan Area as suitable a location for increased residential
density with a Conditional Use Permit. Accordingly, the City will identify site(s) in this
DTSP location that could accommodate residential density at a minimum of 30 and up
to 50 dwelling units per acre, without requiring discretionary review. This would result
in the accommodation of approximately 300 additional units in Downtown.

In addition, on July 1, 2010, the BART Board of Directors unanimously approved the
selection of Alternative 2B as the preferred alignment for the BART system extension to
Livermore, and certified the BART to Livermore Extension Final Program EIR. Alternative 2B
would include a Downtown Livermore station integrated into the existing ACE station.
This decision will significantly increase housing potential in Downtown Livermore beyond
that which is reflected in ABAG projections. This is because the City of Livermore,
anticipating the BART extension, has developed Draft 2009 Housing Element policy that calls
for increased allowable density around all stations sites selected for the BART extension:
• Program 1.1.6, BART Land Use: This main objective of this Program is to revise the General Plan designations and zoning to allow for high-density, mixed-use development around new BART station locations.

Finally, full DTSP buildout will be facilitated by the fact that DTSP housing units are exempt from competing for allocations under the City’s 2008-2010 Housing Implementation Program (HIP). The HIP specifically reserves DTSP housing allocations.

c. Opportunities for Potential Future TOD
Additional potential future TOD could be achieved as described below.

♦ Moderate Approach: 2,470 additional housing units could be built if 40 acres of residential land were redesignated to increase allowable densities from 30 du/ac to 50 du/ac, and if 64 acres of residential land were redesignated to increase allowable densities from 24 du/ac to 50 du/ac. The resulting total number of housing units would be 5,890 units.

♦ Aggressive Approach: 4,050 additional housing units could be built if 40 acres of residential land were redesignated to increase allowable densities from 30 du/ac to 70 du/ac, and if 64 acres of residential land were redesignated to increase allowable densities from 24 du/ac to 70 du/ac. The resulting total number of housing units would be 7,470 units.

d. Conclusion
As stated above, ABAG projects that the Downtown Livermore station area will contain an additional 740 households by 2035. However, this projection does not take into account the expected remaining DTSP capacity of 1,300 units, the 300 units associated with Program 1.1.1 density increases, and the 200 to 400 additional housing units associated with Program 1.1.6 land use redesignations. Therefore, under existing plans and policies it is expected that an additional 1,800 to 2,000 new units could be accommodated in and immediately adjacent to the Downtown Livermore station area by 2035, or 1,060 to 1,260 more than projected by ABAG.

An additional 2,470 housing units could be developed by increasing allowable densities under a moderate approach, and an additional 4,050 housing units could be developed under an aggressive approach.

6. Livermore – Vasco Road
The Vasco Road station area is centered on the existing Vasco Road ACE station, located in eastern Livermore at Vasco Road and the Union Pacific railroad alignment. Land use in the area is generally characterized by light industrial uses. According to ABAG, the ½-mile station area contained approximately 600 households in 2005, and will contain approximately 1,220 households in 2035, a projected increase of 620 households. This projection does not fully capture future TOD capacity in the Vasco Road station area.
As discussed above, existing land use policy in Livermore will result in a significant portion of new households in Livermore located in the City’s Downtown. The majority of the Vasco Road station area is designated for industrial and community facility land uses. However, the BART Board of Directors’ recent approval of a preferred BART to Livermore Extension alternative serving the Vasco Road station, combined with TOD-friendly policies established in the City’s recently-completed Draft 2009 Housing Element (February, 2010), will likely increase the potential for housing development in the Vasco Road station area beyond that which is reflected in the ABAG projections.

a. Regional Support for TOD
No regional TOD policies, designations, or initiatives apply to the Vasco Road station area.

b. Opportunities for Additional TOD under Existing Plans and Policies
The Vasco Road station area contains the “East Side Transitional Areas,” a series of industrial sites identified in the 2003-2025 City of Livermore General Plan as feasible for redevelopment as a Mixed-Use Neighborhood. This General Plan policy resulted in the 2007 adoption of the City’s Brisa Neighborhood Plan, which establishes the future development of up to 650 transit-oriented housing units and associated parkland in the 32.5-acre plan area.

In addition, as previously noted, the BART Board of Directors recently-approved the selection of Alternative 2B as the preferred alignment for the BART system extension to Livermore. Alternative 2B would terminate at the existing Vasco Road ACE station. As is the case in Downtown Livermore, this decision, complimented by Draft 2014 Housing Element policies to maximize TOD around selected BART station sites, will increase the likelihood of high density housing development in the Vasco Station area beyond that which is reflected in ABAG projections.

Program 1.1.1, Residential Sites Inventory, of the Draft 2009 Housing Element, identifies two large sites in the Vasco Road station area for compact housing development, and states that the sites could accommodate approximately 800 housing units. The location of a BART station in the area further facilitates the development of these units.

c. Opportunities for Potential Future TOD
Additional potential future TOD could be achieved as described below.

- Moderate Approach: 375 additional housing units could be built if 18 acres of vacant industrial land were redeveloped with housing at a density of 15 du/ac, and if 50 percent of 14 acres of industrial land were redeveloped with housing at a density of 15 du/ac. The resulting total number of housing units would be 2,425 units.

- Aggressive Approach: 1,080 additional housing units could be built if 18 acres of vacant industrial land were redeveloped with housing at a density of 30 du/ac, if 50 percent of 14 acres of industrial land were redeveloped with housing at a density of 30 du/ac, and if the buildout of the Brisa Neighborhood Plan were increased by 50 percent. The resulting total number of housing units would be 3,130 units.
d. Conclusion
As stated above, ABAG projects that the Vasco Road station area will contain an additional 620 households by 2035. However, this projection does not account for the 650-unit capacity of the Brisa Neighborhood Plan, and the additional 800 units associated with Program 1.1.1 density increases. Therefore, under existing plans and policies it is expected that an additional 1,450 housing units could be accommodated by 2035, or 830 more than projected by ABAG.

An additional 375 housing units could be developed under a moderate approach, and an additional 1,080 housing units could be developed under an aggressive approach.

7. Newark
The Newark station area is generally centered on the intersection of Thornton Avenue and Willow Street in western Newark. According to ABAG, the ½-mile station area contained approximately 190 households in 2005, and will contain approximately 320 households in 2035, a projected increase of 130 households.

There are opportunities for TOD in this station area that significantly exceed ABAG projections. Specifically, the City's ongoing Dumbarton TOD Specific Plan and recently outlined policies in the Draft 2009 Housing Element will facilitate high-density development in the station area over the next two decades.

a. Regional Support for TOD
Although not yet formally designated, the Dumbarton TOD Specific Plan Area, identified as Area Two in the Newark General Plan, is identified by ABAG as a potential PDA. This area is partially contained within the Newark station area.

b. Opportunities for Additional TOD under Existing Plans and Policies
The City of Newark is currently developing the Dumbarton TOD Specific Plan. The 233-acre Plan Area has contained various industrial, manufacturing, chemical processing and salt production facilities since the early twentieth century. The City envisions a transit-oriented community built next to a Dumbarton commuter rail station. According to Terrance Grindall, a City staff member, although the Dumbarton TOD Specific Plan is not yet adopted, a Notice of Preparation (NOP) has been issued for the Plan’s Environmental Impact Report. The NOP states that maximum buildout of the Plan would include 2,500 housing units.

The City is also developing housing policy to promote adoption of the Dumbarton TOD Specific Plan and facilitate high density development around a planned Dumbarton Rail station. According to the City, the Draft 2009 Housing Element was mailed to the California Department of Housing and Community Development (HCD) on February 18, 2010. The City is working to revise the document to meet HCD’s requirements, although these revisions are not expected to result in changes to the land use designations and intensities.

Policy 1 in the document targets the station area for dense development. Program 1 is to, “Facilitate the preparation of specific plans for Areas 2, 3 and 4, and encourage development in those areas: General Plan Areas 2, 3 and 4 consist of the only significant vacant land remaining in the City of Newark.” Area Two is located adjacent to the proposed location of the Newark station on the Dumbarton rail line, and therefore is envisioned for TOD. Some of the high density housing in Area 2 will be needed to meet the City’s State-mandated share of the regional housing need for lower-income households. Therefore, when these parcels are rezoned, the zoning will meet the requirements of Government Code Section 65583(a)(3) and 65583.2, including allowing multi-family uses by right at densities no less than 20 units per acre. It is expected that Area Two would accommodate a total of 1,953 new housing units.

c. Opportunities for Potential Future TOD

Additional potential future TOD could be achieved as described below.

♦ Moderate Approach: 825 additional housing units could be built if 27 acres of residential land were redesignated to increase allowable densities from 15 du/ac to 20 du/ac, and if 23 acres of industrial land were redesignated to allow residential development at a density of 30 du/ac. The resulting total number of housing units would be 3,325 units.

♦ Aggressive Approach: 1,515 additional housing units could be built if 27 acres of residential land were redesignated to increase allowable densities from 15 du/ac to 20 du/ac, and if 23 acres of industrial land were redesignated to allow residential development at a density of 60 du/ac. The resulting total number of housing units would be 4,015 units.

d. Conclusion

As stated above, ABAG projects that the Newark station area will contain 320 households by 2035. However, this projection does not account for the recent Draft 2009 Housing Element policy and future Dumbarton TOD Specific Plan. Conservative estimates reveal the potential for a total of approximately 2,000 to 2,500 units in and immediately adjacent the station area by 2035. Therefore, up to 2,180 additional housing units may be added to the ABAG projections under existing plans and policies.

An additional 825 housing units could be developed under a moderate approach, and an additional 1,515 housing units could be developed under an aggressive approach.

8. North Fair Oaks

North Fair Oaks is an area located in unincorporated San Mateo County, east of State Route 82 near incorporated Redwood City and Atherton. No rail station is currently located in North Fair Oaks, but the area could be the site of a Dumbarton rail station. According to ABAG, the ½-mile station area contained approximately 2,320 households in 2005, and will contain approximately 2,680 households in 2035, a projected increase of 360 households.
North Fair Oaks is a primarily single-family residential area of San Mateo County that provides affordable housing. The area faces several challenges currently being examined by the North Fair Oaks Community Plan. Begun in the early months of 2010, this planning effort has published its existing conditions analysis, which finds opportunities for mixed-use development and TOD in this area. However, no land use alternatives or development projections have emerged from the Community Plan process.

a. Regional Support for TOD
The North Fair Oaks area is not designated as a PDA.

b. Opportunities for Additional TOD under Existing Plans and Policies
Residential land use is the dominant use in North Fair Oaks. Industrial land uses, the second most prevalent land use, are heavily underutilized. Additionally, inconsistencies between land use designations and current zoning prevent more development projects by restricting the supply of available land. The combination of these conditions, while facilitating affordability, restricts growth and blocks the improvement of community conditions.

Despite these challenges, market conditions indicate opportunities for development in the neighborhood. Population growth and larger than average family households will necessitate the development of additional housing. In addition, a job-housing imbalance and a shortage of commercial services may provide an opportunity for job growth and the associated increased housing need. Findings in the existing conditions analysis prepared for the North Fair Oaks Community Plan indicate that an additional housing demand to house new employees due to projected job growth. In addition, re-zoning currently vacant or underutilized land to allow for medium-density housing could accommodate hundreds of new housing units.\(^3\)

c. Opportunities for Potential Future TOD
Additional potential future TOD could be achieved as described below.

♦ Moderate Approach: 710 additional housing units could be built if 179.5 acres of land designated as Medium Density Residential and Medium High Density Residential were built with 10 percent increases in the maximum allowable density, if 10 acres of land designated as High Density Residential were built at 30 du/ac rather than 17.5 du/ac, if residential units built at 20 du/ac were constructed on upper floors above 9.5 acres of Neighborhood Commercial uses along Middlefield Road (at a 15 percent redevelopment rate), and if 38 acres of land designated as General Industrial and General Commercial along Middlefield Road and Edison Road were developed with housing at a density of 20 du/ac (at a 50 percent redevelopment rate). The resulting total number of housing units would be 3,390 units.

♦ Aggressive Approach: 2,880 additional housing units could be built if 179.5 acres of land designated as Medium Density Residential and Medium High Density Residential were built with 10 percent increases in the maximum allowable density, if 10 acres of land designated as High Density Residential were built at 50 du/ac rather than 17.5 du/ac, if

\(^3\) San Mateo County, 2010, *North Fair Oaks Market Demand and Housing Existing Conditions.*
residential units built at 20 du/ac were constructed on upper floors above 9.5 acres of Neighborhood Commercial uses along Middlefield Road (at a 30 percent redevelopment rate), and if 38 acres of land designated as General Industrial and General Commercial along Middlefield Road and Edison Road were developed with housing at a density of 30 du/ac (at an 80 percent redevelopment rate). The resulting total number of housing units would be 5,560 units.

d. Conclusion
As stated above, ABAG projects that the North Fair Oaks station area will contain an additional 360 households by 2035. The presence of underutilized land, along with planning efforts that encourage mixed-use development, suggest that new housing could be built in the station area. ABAG projections seem to account for this potential new development, therefore no additional housing should be expected in addition to ABAG projections under existing plans and policies.

An additional 710 housing units could be developed under a moderate approach, and an additional 2,880 housing units could be developed under an aggressive approach.

9. Redwood City
The Redwood City station area is centered on the existing downtown Redwood City Caltrain station. The station is located on James Avenue, just east of West El Camino Real. According to ABAG, the ½-mile station area contained approximately 2,500 households in 2005, and will contain approximately 5,600 households in 2035, a projected increase of 3,100 households.

a. Regional Support for TOD
The potential for the city to be a densely developed center that serves both local and regional employment centers is reflected in the goals and policies of multiple regional planning documents, such as the San Mateo County Transit-Oriented Development Opportunity Study. Additionally, the station area is designated by ABAG as a PDA.

b. Opportunities for Additional TOD under Existing Plans and Policies
Redwood City lies at the midpoint of several peninsula transit systems and the City has embraced TOD. Redwood City supports TOD and views compact growth as an important element of building a livable and vibrant downtown. A regional ferry terminal and a connecting trolley system are planned for Redwood City. While Redwood City favors compact higher density development, the City’s Downtown Precise Plan in place for the station area sets a maximum of 2,500 new units to be developed.

c. Opportunities for Potential Future TOD
Additional potential future TOD could be achieved as described below.

♦ Moderate Approach: 1,300 additional housing units could be built if the buildout of the Downtown Precise Plan were increased to reflect an allowable density of 30 du/ac. The resulting total number of housing units would be 6,900 units.
Aggressive Approach: 3,900 additional housing units could be built if the buildout of the Downtown Precise Plan were increased to reflect an allowable density of 50 du/ac. The resulting total number of housing units would be 9,500 units.

d. Conclusion
As stated above, ABAG projects that the Redwood City station area will contain an additional 3,100 households by 2035. A variety of planning documents, including the Downtown Precise Plan, appear to already be included in these projections. Therefore, under existing plans and policies it appears that ABAG projections reflect the latest planned densities for the Redwood City station area.

An additional 1,300 housing units could be developed under a moderate approach, and an additional 3,900 housing units could be developed under an aggressive approach.

10. Union City
The Union City station area is centered on the existing Union City BART station, located south of Decoto Road and east of Alvarado Niles Road. According to ABAG, the ½-mile station area contained approximately 1,820 households in 2005, and will contain approximately 4,340 households in 2035, a projected increase of 2,520 households. Evaluation of recent land use policies and initiatives indicates that this is an accurate projection of TOD potential in the station area.

The City of Union City has recently begun to implement its high-density, transit-oriented Intermodal Station District and Transit Facility Plan. Although adopted in 2002, recent progress associated with this plan reveals an increasing potential for full buildout of the plan area, which is largely contiguous with the Union City station area.

a. Regional Support for TOD
The Union City Intermodal Station District has been identified as a regional PDA. The station area is also one of eight TOD sites at BART stations in Alameda County identified for future funding in the Alameda County Congestion Management Agency's Countywide Transportation Plan.

b. Opportunities for Additional TOD under Existing Plans and Policies
As noted above, the Union City Intermodal Station District and Transit Facility Plan establishes policy in support of high-density, mixed-use development around the Union City BART/Intermodal Station. Development of the District will transform industrial lands adjacent to the BART station into a compact, integrated downtown neighborhood. At full buildout, the Plan Area will contain 1,854 dwelling units and 1.2 million square feet of commercial space within ½-mile of the BART station. A land use framework for this plan was established in the City’s 2002 General Plan land use map, in the form of residential land uses of 45 to 80 dwelling units per acre in the station area. A significant portion of this development has already been constructed, including the 438-unit, Avalon Bay Union City and a 216-unit townhouse community developed by KB Homes.
Recently secured funding offers further indication that the BART station area will be built out as per the *Intermodal Station District and Transit Facility Plan*. In July, 2010 the City received $4.45 million in Transportation for Livable Communities grant from the Metropolitan Transportation Commission, as well as a $1.9 million grant from the Federal Transit Administration, toward completion of the station district.

c. Opportunities for Potential Future TOD

Additional potential future TOD could be achieved as described below.

- Moderate Approach: 1,600 additional housing units could be built if 52 acres of industrial land were redesignated to allow multi-family housing at 40 du/ac, and if the 14-acre BART parking lot were redeveloped with multi-family housing at 40 du/ac. The resulting total number of housing units would be 5,940 units.

- Aggressive Approach: 4,080 additional housing units could be built if 52 acres of industrial land were redesignated to allow multi-family housing at 40 du/ac, the 14-acre BART parking lot were redeveloped with multi-family housing at 40 du/ac, and 36 acres of commercial land were redesignated to allow multi-family housing at 40 du/ac. The resulting total number of housing units would be 8,420 units.

d. Conclusion

As stated above, ABAG projects that the Union City station area will contain an additional 2,520 households by 2035. This projection is consistent with the residential capacity of the *Intermodal Station District and Transit Facility Plan*, the remaining developable station area land and regional TOD initiatives.

An additional 1,600 housing units could be developed under a moderate approach, and an additional 4,080 housing units could be developed under an aggressive approach.

D. Summary

Table 1 summarizes the findings of the land use evaluation.

Under existing plans and policies, the land use evaluation shows that approximately 5,020 total housing units can be expected in the station areas in addition to the households projected by ABAG. These housing units are expected to be located in the following station areas:

- Fremont – Centerville (750 additional housing units)
- Downtown Livermore (1,260 additional housing units)
- Livermore – Vasco Road (830 additional housing units)
- Newark (2,180 additional housing units)

Under a moderate approach, an additional 15,975 housing units could be developed in the station areas above ABAG projections and growth under existing plans and policies. These housing units could occur in the station areas as follows:

- East Palo Alto/Menlo Park (2,055 additional housing units)
Downtown Menlo Park (2,020 additional housing units)
♦ Fremont – Centerville (1,280 additional housing units)
♦ Fremont – Warm Springs (3,340 additional housing units)
♦ Downtown Livermore (2,470 additional housing units)
♦ Livermore – Vasco Road (375 additional housing units)
♦ Newark (825 additional housing units)
♦ North Fair Oaks (710 additional housing units)
♦ Redwood City (1,300 additional housing units)
♦ Union City (1,600 additional housing units)

Under an aggressive approach, an additional 36,340 housing units could be developed in the station areas above ABAG projections and growth under existing plans and policies. These housing units could occur in the station areas as follows:
♦ East Palo Alto/Menlo Park (3,425 additional housing units)
♦ Downtown Menlo Park (3,260 additional housing units)
♦ Fremont – Centerville (3,470 additional housing units)
♦ Fremont – Warm Springs (8,680 additional housing units)
♦ Downtown Livermore (4,050 additional housing units)
♦ Livermore – Vasco Road (1,080 additional housing units)
♦ Newark (1,515 additional housing units)
♦ North Fair Oaks (2,880 additional housing units)
♦ Redwood City (3,900 additional housing units)
♦ Union City (4,080 additional housing units)
Appendix E: Funding Analysis
The Dumbarton Rail Corridor project is undergoing a re-evaluation of alternatives including service alternatives, ridership estimates, service plans, costs and funding. This funding analysis includes a review of the status of committed revenues and an analysis of potential future funding for the project. This funding analysis was completed in light of funding plan requirements for NEPA and CEQA documents.

Committed Funding

Based on this review, there are approved and adopted funding commitments for approximately $345 million. While this amount is less than half of the cost of the original rail alternative studied, it is a substantial commitment. The sources are varied and consist primarily of reliable transportation funding sources: local sales taxes in Alameda, San Mateo and Santa Clara counties and bridge tolls. State sources include the RTIP and ITIP. There are issues surrounding the timing and availability of these revenues that impact the Dumbarton Rail Corridor financial plan. Those issues are discussed in greater detail below.

Approximately $27 million of the committed funding has been allocated toward the project. Of this amount, all but $3.35 million is for use on the preliminary engineering, environmental, and right of way phases. For purposes of this review, we assume that all of the allocated funds have been spent or encumbered, leaving about $321 million in committed but not yet allocated funds.

The capital costs for the original project concept total $701 million. Several rail alternatives are currently being considered, which could increase total costs as high as $820 million. Thus, the funding gap for the project ranges from $356 million up to $475 million. These funds will need to be assembled from multiple sources, which could include additional use of current sources such as local sales taxes and bridge tolls, as well as emerging regional, state, and federal opportunities that might be relevant to the Dumbarton corridor. There is significant opportunity to influence investment decision-making in the next several years, so we recommend that the draft environmental document be finalized while the full funding plan is being developed.

The Dumbarton Corridor Rail project funding status is described in more detail below and summarized in the attached table.

Funding Challenges for Dumbarton Rail Committed Funding

Funding for the project is identified in MTC’s Regional Transit Expansion Program, Resolution 3434. As such, regional discretionary funds and local funding are committed to the project. Additionally, the project is included in the sales tax expenditure plans for San Mateo, Alameda, and Santa Clara counties. The timing for three sources of funding are uncertain.

**RTIP Swap:** The Metropolitan Transportation Commission’s (MTC’s) reprogramming of $91 million of RM2 bridge toll funds in September 2008 significantly changed the funding picture for the project. MTC reassigned $91 million in RM2 funds from the project to the BART Warm Springs project, replacing the $91 million with Alameda County Regional Transportation Improvement Program (RTIP) funds. In December 2008, the ACCMA Board approved the...
action, taking $91 million committed to the BART Warm Springs project and dedicating it to the Dumbarton Project.\(^1\) However, this substitution of $91 million in RM2 funds with future Alameda RTIP funds could result in a significant delay in project funding, particularly if State budget problems continue to complicate the programming and allocation process.

Currently, ACCMA has $200 million in Resolution 3434 capital projects that are in line to receive STIP dollars:

- AC Transit BRT -- $40 million
- BART Warm Springs -- $61 million
- Dumbarton Rail -- $91 million

Of these three projects, only the first two are in the Countywide Transportation Plan (CWTP), and both are identified in the CWTP as high priority projects.

The ACCMA Board has approved a policy that allocates up to a maximum of 50 percent in STIP revenues to the three Resolution 3434 projects. Further, by Board policy a minimum level of 25 percent of programmed dollars are committed to the BART Warm Springs project. In October 2008, the ACCMA projected that it would take until 2024 or 8 STIP cycles before $200 million in STIP funds had been allocated to the three projects. (This was based upon an assumption that of $40 million in STIP funding in the next two year cycle, scheduled to begin in 2010.)

MTC, in reprogramming the dollars in support of the BART Warm Springs project, and in cooperation with Caltrain and other funding partners agreed to\(^2\):

1. Support completion of the alternatives analysis and environmental phase
2. Support steps toward the purchase of Right-of-Way in the ACE, Capitol, and Dumbarton Corridors
3. Support expanded cost-effective express bus service in the corridor to build ridership
4. Explore other funding opportunities, including the potential for future bridge tolls, to accelerate repayment of the reassigned $91 million in RM2 funds
5. Explore other funding opportunities, including the potential for future bridge tolls, to close the $300 million project shortfall.

**Interregional Transportation Improvement Program (ITIP):** Like the RTIP funds described above, ITIP funds are subject to state budget approval and could be at risk either in terms of magnitude or timing as the State works to close its structural budget gap.

**VTA Measure A Sales Tax:** Another source of funding that is more ambiguous in terms of timing, are Santa Clara County Measure A funds. The 2000 ballot measure named the Dumbarton Rail Corridor as a project that would receive Measure A funds. The specific language is below:

> Connect Caltrain with Dumbarton Rail Corridor

Provide VTA’s share of matching funds for a partnership with Alameda and San Mateo counties for the rebuilding of the Dumbarton Rail Corridor to connect to Caltrain and train sets for this new service conditioned on Alameda and San Mateo County’s funding.

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1 Alameda County Congestion Management Agency, Agenda Item 7.2, December 11, 2008, Board Meeting.
2 Metropolitan Transportation Commission, Regional Transit Expansion Program Update, Resolution 3434, September 24, 2008.
The Dumbarton Rail Corridor project was included in VTA’s VTP 2035, adopted January 2009, at a funding level of $44 million. Further, conversation with VTA staff indicates that there is no funding in the ten-year Capital Improvement Plan and there appears to be little support for the project at this time.

Overall, these three sources share some common challenges that will need to be addressed to keep the project moving forward. Specifically, it is unknown whether the promised funding will materialize in the time frame needed to meet the current project schedule. And, some funding commitments may have timely use provisions that would place one source of funding in jeopardy in the event of delays from another source.

Potential Future Funding for Dumbarton Rail

To complete a full plan of finance for the Dumbarton Rail Corridor project, somewhere between $350 and $475 million in additional funding will need to be identified. Given the size of this requirement, multiple sources will be needed, potentially including unexpected new sources that may arise in the future.

We have met with MTC, Alameda CTC, and FTA staff and discussed the potential future sources. Staff agreed that the following sources seem to be the most promising sources of capital funding for the project:

- **Cost offsets due to CCJPA HSR funds**: CCJPA has indicated that it will seek $235.31 million in funding for the Oakland to San Jose Corridor, which includes a portion of Dumbarton Rail. Where the alignments overlap, these funds could support some of the project components necessary for Dumbarton Rail.

- **Bridge Tolls**: Existing bridge toll funding arrangements under Regional Measure 2 (RM2) include provisions for transit operating assistance that has been used in the past as leverage for debt issuance. It is possible that a similar arrangement could help finance Dumbarton Rail. Separately, MTC is currently engaging in the Transit Sustainability Project, which will recommend plans for the improvement and long term development of the Bay Area transit network, including identifying more stable sources of funding. One possibility is that future bridge tolls might be designated to support investments in transit infrastructure in the region, potentially including the Dumbarton Rail Corridor.

- **Alameda County Measure B renewal**: ACTC has indicated that the Expenditure Plan for a new Measure B will include projects that fill gaps in the regional rail network, which Dumbarton does. Funding would likely be at least at the same level as the current measure, and perhaps as much as double.

- **Other Federal**: Existing federal programs such as New Starts could be a source of capital funding, though this might substitute for, rather than augment, some of the other identified sources.

- **Public/Private Partnerships**: Increasing regional emphasis on focusing growth in Priority Development Areas (PDAs) and State requirements for land-use compatibility under the new Sustainable Communities Strategy process both increase the likelihood that Dumbarton Rail would include significant station-area development plans. To the extent that the plans include TOD features such as housing and retail, partnerships with private developers may provide a meaningful funding contribution towards overall project costs. Also, an operating model for Dumbarton Rail has yet to be identified. If a concession model is pursued, this could provide an opportunity to leverage private investment in a way that supports overall project goals.
Of the items described above, the most likely opportunities to influence investment decision-making over the next year include:

- MTC’s Transit Sustainability Project, which will consider the future funding of transit in the region and the possible expansion of bridge tolls
- Alameda Countywide Transportation Plan, which will address all transportation modes and will consider a new sales tax measure and expenditure plan
- Federal Transportation Bill reauthorization, which will lay out federal funding for the next 5 years, including New Starts, which the DRC might compete for in the future

In addition to the potential sources cited above, funding opportunities may arise unexpectedly. To be successful at taking advantage of these opportunities, they must be quickly evaluated to determine whether a new source is an appropriate match to project needs and then conduct the necessary planning and advocacy activities to acquire funding.

Funding Plan Requirements and Environmental Clearance

Two separate processes will need to be pursued in parallel in order to keep the project moving forward. First, a conceptual funding plan should be developed that is sufficiently detailed to support preparation of draft environmental documentation. The DEIR/DEIS would need to identify current and potential future capital and operating funding sources. Completion of the FEIS/FEIR will require a funding plan that shows more detailed programming commitments. At the same time as the draft environmental review is underway, funding commitments should be pursued from all available sources with a goal of securing full funding commitments before the expiration of the DEIR/DEIS document.

Identifying a full funding plan that will be acceptable to the FTA, may take some time. Given the planning and programming opportunities available in the near term, it is possible that the draft environmental document could be made final and circulation could begin within a year, though this is clearly a ‘best case’ scenario. If the majority of the funding is committed within the next three years or so, the DEIS/DEIR can be finalized and final design and construction can begin shortly thereafter. If the funding is not programmed within the next three years, then a re-evaluation of the environmental document would be needed before the FEIS/FEIR is issued. The benefit of circulating the DEIS/DEIR now is that the project is better positioned to take advantage of funding opportunities as they arise and advocacy for the project can begin in the near term.

Conclusion

This initial review indicates that $27 million has been allocated to the project and is assumed to be fully obligated to current or near term expenses. An additional $321 million is committed to the project, but the timing and availability of these funds is not certain. Multiple sources will need to be utilized in the development of a full funding plan for the remaining $350 to $475 million in funding needed for a rail alternative. Given the wide variety of funding opportunities on the near term horizon, it is recommended that the draft environmental document be finalized and that a full funding plan be pursued in parallel, with the hope that a plan of finance could be finalized before expiration of the DEIR/DEIS.
# Dumbarton Rail Corridor Funding Analysis

January 11, 2011

## CURRENT FUNDING

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount (in 1,000's)</th>
<th>Commitment Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMCTA: Original and New Measure A</td>
<td>$97,213</td>
<td>Programmed through the Expenditure Plan or allocated by Board Action.</td>
</tr>
<tr>
<td>ACTIA</td>
<td>$19,167</td>
<td>Programmed through the Expenditure Plan or allocated by Board Action.</td>
</tr>
<tr>
<td>MTC: RM-2</td>
<td>$44,057</td>
<td>Programmed through Resolution 3434 or Allocated by Board Action.</td>
</tr>
<tr>
<td>MTC/ACCMA RTIP Swap</td>
<td>$91,000</td>
<td>ACCMA adopted a resolution in December 2008 committing RTIP funds to project. If RTIP funds are unavailable in a timely manner, then per Resolution 3434, RM-2 funds should be requested.</td>
</tr>
<tr>
<td>VTA</td>
<td>$44,000</td>
<td>$2,963 allocated. The remainder committed through Expenditure Plan. No programming in 10 Year CIP.</td>
</tr>
<tr>
<td>ACCMA</td>
<td>$14,000</td>
<td>Programmed per Resolution 3434.</td>
</tr>
<tr>
<td>ITIP</td>
<td>$39,000</td>
<td>Programmed per Resolution 3434.</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$348,437</strong></td>
<td></td>
</tr>
</tbody>
</table>

## FUTURE/POTENTIAL FUNDING

<table>
<thead>
<tr>
<th>Source</th>
<th>Range: Low to High (in 1,000's)</th>
<th>Commitment Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARRA High Speed Rail Funding/Capital Corridor Application</td>
<td>TBD</td>
<td>CCJPA has indicated that it will seek $235.31 million in funding for the Oakland to San Jose Corridor, which includes a portion of Dumbarton Rail.</td>
</tr>
<tr>
<td>ARRA Intercity Funding from Caltrain</td>
<td>$20,000 - $30,000</td>
<td>In order to be eligible for this funding, Caltrain will need to be considered intercity.</td>
</tr>
<tr>
<td>Future Bridge Tolls</td>
<td>$125,000 - $150,000</td>
<td>New bridge tolls as part of the MTC Transit Sustainability Program.</td>
</tr>
<tr>
<td>RM2 Operating Funds</td>
<td>$20,625 - $28,105</td>
<td>Assuming that the $5.5 million annually in operating funds can be used to pay off debt, range reflects difference between operations beginning in 5 versus 7 years. Modeled on the WETA arrangement with MTC for RM2 operating funds, assume that 73% of the expected revenue will be available as debt proceeds.</td>
</tr>
<tr>
<td>Measure B Renewal in Alameda County</td>
<td>$25,000 - $50,000</td>
<td>ACTA indicated that the Expenditure Plan for a new Measure B will include projects that fill gaps in the regional rail network, which Dumbarton does. Given that, there is an assumption that funding would be at least at the same level as the current measure, and perhaps double.</td>
</tr>
<tr>
<td>New Starts</td>
<td>$200,000 - $300,000</td>
<td>This funding source would be in place of those identified above.</td>
</tr>
</tbody>
</table>

Notes: 1. If this funding source is used, the project will come under the jurisdiction of the FRA instead of the FTA which would be undesirable.