



CAPITOL CORRIDOR

2014 Vision Plan Update

Final Report

November 19, 2014
CCJPA Board Adoption



Table of Contents

	Page
1 Introduction.....	3
2 Background.....	4
History of Growth	5
Recent Funding and Outlook.....	6
Blended Plan and the IPR Coalition.....	7
Prior Vision Plan Updates, Regional Rail Plan, and Emerging Megaregion Plan.....	7
3 Short- and Medium-Term Plans	9
Short-Term Plan.....	9
Medium-Term Plan.....	12
4 Long-Term Plan.....	15
Principles and Objectives	15
Toolbox	16
Responding to Climate Change and Sea-Level Rise.....	18
Process.....	21
Concepts by Segment.....	22
Travel Time by Alignment Alternatives.....	33
5 Initial Ridership Analysis.....	38
Ridership Modeling Results.....	41
Other Ridership and Market Analysis Tools	42
6 Next Steps.....	44
Vision Implementation Plan Elements.....	44
Vision Communications Plan	46
Appendix A Conceptual Schedules.....	47

Table of Figures

	Page
Figure 2-1 Capitol Corridor Service Area.....	5
Table 3-1 Oakland to San Jose Frequency Expansion, Phase Two	10
Table 3-2 Placer County Service Expansion	10
Table 3-3 Monterey County Service Extension.....	11
Table 3-4 Oakland to San Jose Frequency Expansion Table – Phase Three.....	12
Table 3-5 Placer County Service Expansion	13
Table 3-6 Monterey County Service Extension.....	13
Figure 4-1 San Jose-Oakland Alignment Alternatives.....	24
Figure 4-2 Alignments through Central Oakland	26
Figure 4-3 Richmond-Suisun/Fairfield Alternatives.....	29
Figure 4-4 Reconstructed Freight Right-of-Way in Suisun/Fairfield-Sacramento Segment	32
Figure 4-5 Martinez-Richmond Alignment Options	33

Figure 4-6	Oakland-San Jose Alignment Options	35
Table 4-1	Alternative Alignments and Baseline Travel Times.....	36
Table 4-2	Adjusted Travel Times.....	36
Table 5-3	Adjusted Travel Times.....	41
Table 5-1	Ridership Estimates	42
Table A-1	Schedule: Alternative A: Southbound/Westbound:AM/Mid-Day.....	47
Table A-2	Schedule: Alternative A: Southbound/Westbound:PM.....	48
Table A-3	Schedule: Alternative A: Northbound/Eastbound:AM/Mid-Day.....	49
Table A-4	Schedule: Alternative A: Northbound/Eastbound:PM.....	50
Table A-5	Schedule: Alternative B: Southbound/Westbound:AM/Mid-Day	51
Table A-6	Schedule: Alternative B: Southbound/Westbound:PM	52
Table A-7	Schedule: Alternative B: Northbound/Eastbound:AM/Mid-Day	53
Table A-8	Schedule: Alternative B: Northbound/Eastbound:PM	54
Table A-9	Schedule: Alternative C: Southbound/Westbound:AM/Mid-Day.....	55
Table A-10	Schedule: Alternative C: Southbound/Westbound:PM.....	56
Table A-11	Schedule: Alternative C: Northbound/Eastbound:AM/Mid-Day.....	57
Table A-12	Schedule: Alternative C: Northbound/Eastbound:PM.....	58

1 INTRODUCTION

This update of the Capitol Corridor Vision Plan is the first update to the Vision Plan in nine years. The updated vision outlined in this document represents a bold departure from the past. It envisions a railroad dramatically different from what exists today: much faster, more frequent, cleaner, quieter, better connected and altogether more attractive to users.

The Capitol Corridor envisioned in this document would be a modern railroad built to international standards, electrified and capable of top speeds of 150 miles per hour. This could reduce travel times between Sacramento and Oakland to roughly an hour, and between Oakland and San Jose to a half-hour. This plan also envisions a direct connection to BART in central Oakland, just minutes from San Francisco.

To achieve this vision, billions of dollars in investments would be required. This plan represents a first step toward mapping out a long-term strategy for investment. It outlines a range of options for improving speeds, as well as improving reliability and addressing the effects of climate change and sea-level rise. It also includes preliminary analysis of the potential performance and impacts of those improvements. However, other elements such as potential costs and an implementation strategy will be included in future companion planning documents.

In addition to this introduction, this document includes:

- Necessary context for the Vision Plan, including a review of the Capitol Corridor's administrative structure, history, funding sources and partnerships, as well as a review of previous relevant plans including a 2013 draft update that formed the basis for this document.
- A summary of the Capitol Corridor's existing short- and medium-term plans.
- A description of the long-term Vision Plan, including principles and objectives, the toolbox of measures used, implications of sea level rise, the Plan process and the draft alternatives that have been developed.
- Next steps in the planning process.

2 BACKGROUND

The Capitol Corridor runs 15 daily round trips between Sacramento and the Bay Area. The Capitol Corridor Joint Powers Authority (CCJPA) oversees the service, with Amtrak running day-to-day operations under contract. For most of the route's 171 miles, trains operate on tracks owned by the Union Pacific Railroad (UPRR), though Caltrain owns the tracks used for the southernmost 2.5 miles of the route. Most of the system's rolling stock is owned by the State of California, administered through the California Department of Transportation (Caltrans) Division of Rail, but the authority leases some additional train sets through Amtrak.

The CCJPA is governed by a Board of Directors comprised of 16 elected officials from six member agencies along the route:

- Placer County Transportation Planning Agency (PCTPA)
- Solano Transportation Authority (STA)
- Yolo County Transportation District (YCTD)
- Sacramento Regional Transit District (Sac RT)
- San Francisco Bay Area Rapid Transit District (BART)
- Santa Clara Valley Transportation Authority (VTA)

Ex-officio members of the CCJPA include the two metropolitan planning organizations along the route, the Metropolitan Transportation Commission (MTC) and the Sacramento Area Council of Governments (SACOG).

As administrator for the Capitol Corridor, the CCJPA's responsibilities include overseeing day-to-day train and bus scheduling and operations, overseeing the Amtrak-owned rolling stock used on the Capitol Corridor and San Joaquin routes, and interfacing with Amtrak and the UPRR on dispatching, engineering, and other railroad-related issues.

Today, the Capitol Corridor serves 17 stations in Placer, Sacramento, Yolo, Solano, Contra Costa, Alameda, and Santa Clara counties. Figure 2-1 shows the alignment, which parallels the I-80/I-680 highway corridor between Sacramento and Oakland and I-880 between Oakland and San Jose.

Figure 2-1 Capitol Corridor Service Area



To supplement train service, the Capitol Corridor provides dedicated bus connections to San Francisco and communities south of San Jose and east of Sacramento. In addition, the CCJPA works with transit agencies and other partners to provide local connections throughout the corridor. The train service connects with BART at the Richmond and Oakland Coliseum stations; Caltrain at San Jose Diridon station; the Altamont Commuter Express (ACE) commuter rail line at the Fremont/Centerville, Great America/Santa Clara, and San Jose Diridon stations; the San Joaquin line at Oakland Jack London, Emeryville, Richmond, Martinez, and Sacramento stations; VTA light rail at Great America and San Jose Diridon stations; and Sac RT light rail at Sacramento station. Together with these local transit systems, the Capitol Corridor covers the second-largest urban service area in the Western United States.

HISTORY OF GROWTH

On December 12, 1991, Caltrans and Amtrak launched the Capitol Corridor with six daily trains, or three round trips, between San Jose and Sacramento. State legislation established the CCJPA in 1996, and a 1998 Interagency Transfer Agreement officially gave the CCJPA responsibility for the service for an initial three-year term. After an extension in July 2001, the sunset date was eliminated in 2003, establishing CCJPA as permanent manager of the Capitol Corridor.

In response to growing demand in the early 2000s, the CCJPA expanded service three times in 2002-2003 to a schedule of 12 weekday roundtrips between Sacramento and Oakland, using the same budget as was allocated for nine daily round trips. The authority expanded service again without an increased budget allocation in 2006, growing to 16 weekday (11 weekend day) round trips between Sacramento and Oakland, which amounted to hourly service in that segment. Seven of the daily round trips traveled the full length of the route, serving San Jose. A first phase of Oakland-San Jose track improvements and the addition of a second main track on the Yolo Causeway contributed to a 10-minute travel-time reduction and enabled the expansion in San Jose service.

The opening of the new Sacramento Station in August 2012 allowed the CCJPA and San Joaquin services to optimize their operations at the station. The update added greater track capacity, which allowed the CCJPA to transfer two daily round trips to the sister service, leaving the Capitol Corridor with 30 daily trains, or fifteen round trips. Seven of the round trips still reach San Jose, and one reaches as far east as Auburn. Current service levels use all of the negotiated “slots” reserved for passenger trains on the Union Pacific Railroad’s right-of-way, and as such, further expansions will require additional negotiations or the construction of dedicated passenger right-of-way. The latter is discussed in this long-term plan.

The track-capacity improvements, corresponding service expansions, and train equipment acquisitions have enabled the Capitol Corridor to significantly grow ridership and revenues over the last decade, and the route is now the third busiest in the Amtrak national system.

RECENT FUNDING AND OUTLOOK

The Capitol Corridor outlined a short-term vision in the early 2000s, but a lack of capital funding sources stalled progress on most of the short-term improvements included in the document.

Since the vision was first expressed in 2002 and updated again in 2005, adjustments to the State Transportation Improvement Program’s funding-allocation formulas, which previously provided steady support for intercity passenger rail, resulted in an approximate 90 percent decrease in capital funding. California’s budgetary difficulties during the period and the 2008 recession exacerbated the situation. Though California voters approved several state bond measures that provided some money for short-term improvements over the last decade and a half, the CCJPA was unable to find enough capital to move forward on many pieces of that original vision.

However, prospects for new funding look better today than they have in many years. State lawmakers allocated \$50 million in revenues from the new Cap and Trade program for local transit and intercity rail investments in the program’s first year. Federal policymakers have also increased their focus on intercity passenger rail in recent years, though it has not yet amounted to much new funding. The 2008 Passenger Rail Investment and Improvement Act jump-started the nation’s focus on a high-speed and intercity passenger rail, and though Congress let it expire in 2013 without allocating funding to it, policymakers have been considering a replacement bill to establish a steady source of merit-based project funding. President Obama’s most recent five-year budget proposal also allocated \$40 billion toward intercity and high-speed rail projects, though Congress has not approved funding at this level.

Stakeholders at the state and federal levels are also exploring alternatives to the gas tax as the country’s primary source of transportation funding. The buying power of the federal gas tax has been steadily declining over the last two decades, and a combination of increased fuel efficiency and declining levels of per capita vehicle miles traveled have further reduced the transportation-

funding pie. Despite political gridlock in Washington, D.C., a growing recognition of this problem, combined with an increasing sense of urgency to make investments in steadily deteriorating infrastructure, make it increasingly likely that policymakers will come up with a solution in the coming years.

In sum, while funding has declined at the state and federal levels in recent years, the prospects for future increases are looking better than they have in quite some time. This vision will position the Capitol Corridor to take advantage of new funding opportunities to help the service reach its true potential as the spine of the megaregion.

BLENDED PLAN AND THE IPR COALITION

The State of California began taking significant strides to truly integrate passenger rail services across the state in 2012. The California High Speed Rail Authority's (CHSRA) business plan called for a system that blended high-speed rail with intercity services, reducing capital costs while maximizing the impact of high-speed-rail-related investments. The Capitol Corridor, San Joaquin, and Pacific Surfliner joined in supporting the plan.

Today, working groups for Northern and Southern California, each including representatives from the CHSRA and the Federal Railroad Administration and with direction from the California State Transportation Agency (CalSTA), are jointly pursuing a variety of planning efforts to ensure that the various operators are strongly integrated in time for funding milestones. In the short term, as the high-speed rail system is built out, Intercity Passenger Rail (IPR) services would provide a bridge between the Central Valley and the state's major metropolitan areas. Over the long term, IPRs would provide complementary services in corridors in which high-speed rail operates and branch off in other areas to extend the state's rail service area to smaller cities.

The IPR coalition's ultimate vision is that Northern California's rail operators would join together in rolling-stock procurement, service and operations planning, funding advocacy, and capital-project prioritization, to grow passenger rail use in California over the long term. For future customers, the groups' goal is that blended services will integrate seamlessly with each other and with the broader transportation system. This would represent a major change in the way customers relate to passenger rail in California.

PRIOR VISION PLAN UPDATES, REGIONAL RAIL PLAN, AND EMERGING MEGAREGION PLAN

The plan also comes on the heels of two major planning efforts led by MTC, the Bay Area's Regional Rail Plan and the Northern California Emerging Megaregion Plan.

The Regional Rail Plan, released in 2007, called for a significant increase in rail investments and called out the Capitol Corridor as an important part of that vision. Capitol Corridor-related investments called for in the plan included expanding to at least three sets of tracks between San Jose and Sacramento, with a four-track section between Oakland and Richmond and in Solano County. It projected that with these investments, travel times between San Jose and Sacramento could be reduced to 149 minutes. It called for better coordination among all of the region's operators, to help with freight-operator negotiations, and it highlighted right-of-way acquisition as a high priority.

The Emerging Megaregion Plan, released in 2009, was one of the first efforts to understand interregional issues in the Sacramento-Bay Area corridor, connected by I-80 and the Capitol

Corridor. The report was an outgrowth of the efforts of a steering committee that convened in 2006 with staff from regional agencies, Caltrans, the regional air districts, local governments along the corridor, and other stakeholders. It compared several travel-demand forecasts for the corridor and noted that freight traffic between the regions is projected to increase significantly over the coming decades, putting additional pressure on private auto travel and passenger rail services. Though the model projections showed varying levels of Capitol Corridor ridership growth, the report called on the regions to prioritize capital investments for the train line and find a dedicated funding source for the service. Tolling I-80 was one potential funding source noted in the report.

This Vision also follows in the footsteps of the several previous CCJPA visioning efforts. The authority developed an initial vision for the route in 2002, as it initiated the projects that would lead to the 2006 service expansion. The document simply aimed to articulate what was next for the authority after those capital projects. As the state budget situation changed, the authority updated the vision in 2005, identifying short- and long-term goals to guide the CCJPA's operating and capital-development plans for the next 20 years. As noted earlier, very little of the updated vision has been implemented because of the state's budgetary situation over the last decade.

As the financial outlook for intercity passenger rail brightened and as high-speed-rail planning and coordination efforts gained momentum, the CCJPA set out to update the vision in 2012, and released a draft Vision Plan update in 2013, which, based on CCJPA Board direction at the time, served as the foundation for this document. The 2013 draft update laid out a specific set of short- and medium-term projects and noted in more general terms potential long-term projects that would increase speeds and frequencies in different segments of the corridor. This document builds on the objectives stated by the CCJPA Board in 2013 and further develops many of these ideas, noting specific alignment alternatives in each segment.

3 SHORT- AND MEDIUM-TERM PLANS

The Capitol Corridor's long-term vision will be built on smaller short- and medium-term projects that, together, have the potential to significantly improve the service and ensure that capital assets in the corridor stay in working order. The sections below note specific projects that can be executed, at a moderate cost, in the next 10 to 20 years. They largely presume the same rolling stock equipment, operating speeds, and look and feel of the Capitol Corridor service as it exists today, unless noted. It is critical to also understand that the Capitol Corridor service in the short and medium term will continue to be the tenant to Union Pacific Railroad and Caltrain. This directly influences the scope and content of the short and medium term service expansion plans.

SHORT-TERM PLAN

Over the short term, the Capitol Corridor is focused on service-expansion projects the agency has been pursuing since 2005. It is feasible for all of these projects to be under construction or completed in the next 10 years.

The 2006 service expansion, and the resulting increases in ridership and revenue, showed the potential of the San Jose-Oakland market with the completion of the Oakland to San Jose Phase One project, and the short-term vision includes investments that would further bolster this part of the corridor. The plan also notes other markets with potential for growth, including Placer County and areas south of San Jose, to Salinas. This Vision Plan update targets each of these markets for extensions or service frequency increases. The short-term plan also includes additional on-board and station amenities.

Oakland to San Jose Service Frequency Expansion: Phase Two

Phase two of the Oakland-San Jose service expansion would build incrementally on the first phase, growing from 7 to 11 daily round trips. This expansion will require rail-infrastructure improvements in that section of the corridor, to both preserve existing and enable future growth patterns for both freight and passenger services. The CCJPA will continue to work with the host railroads (UPRR and Caltrain) to implement the particular blend of track infrastructure projects that will provide the appropriate track-capacity enhancements.

Specifically, the CCJPA is exploring a change in route south of the Oakland Coliseum that may offer travel time savings and allow for better operating patterns than the existing alignment. If the CCJPA pursues such a shift, the authority will work with Hayward and Fremont, two communities that would see low-ridership stations moved, to identify an appropriate location and build a replacement station on the new alignment. Based on ridership modeling using the Amtrak Ridership and Revenue Model, the change in alignment and accompanying service increase does yield some minor ridership difference from the current alignment, and that improves slightly when a new station is added. The context of a decision to select a new alignment or remain on the existing alignment with respect to this project will need further analysis and the process for doing

so is outlined below in the discussion of the long-term vision. There are aspects of the Oakland-San Jose service expansion that are not related to the alignment options and those improvements, south of Fremont, will be pursued while analysis is being conducted on alignment options.

The ultimate vision is to grow service to 16 daily round trips. The medium-term plan includes the infrastructure and service-plan changes needed to make this happen.

Table 3-1 Oakland to San Jose Frequency Expansion, Phase Two

Phase	Status	Frequency Gain	Funding Secured	Funding Need Estimate
Phase Two	Planned	7 to 11 round-trips	\$50.8 Million	\$250 Million

Placer County Service Expansion

Placer County stations have been served by one westbound morning train and a late afternoon/early evening eastbound train since Capitol Corridor service began in 1996. Expanding this service is one strategy for reducing congestion on the section of I-80 between Sacramento and Auburn, which has seen increased volumes since the 1990s and is projected to see further increases in the future.

The CCJPA and UPRR nearly partnered to make track improvements that would enable one additional daily round trip in this portion of the corridor, but the UPRR ultimately had to invest elsewhere in its railroad network.

The 2005 Vision Plan included a goal of increasing service between Roseville and Sacramento. Since the plan was released, the CCJPA has now completed the initial design and the environmental documentation processes is underway a this time to grow from today’s single daily round trip to ten. This work laid a foundation that will allow the authority to move directly into construction, should sufficient funding become available in the coming years. Construction is expected to be completed in phases, allowing for incremental growth in service levels over the short term. Investments required to meet the 10-round-trip goal are included in the medium-term plan. The projected five round trips and costs noted in Table 3-2 are a placeholder, subject to future negotiations, phasing discussions, and funding availability.

Table 3-2 Placer County Service Expansion

Phase	Status	Frequency Gain	Funding Secured	Funding Need Estimate
Auburn Expansion	Planned	1 to 2 round-trips	\$0	\$50 Million
Roseville Expansion	Planned	1 (2, with Auburn Expansion) to 5 round-trips	\$18.8 Million	\$100 Million

Monterey County Extension

Highway congestion between San Jose and Salinas along U.S. Highway 101 is a common frustration for travelers. The Transportation Agency for Monterey County (TAMC) approached both Caltrain and CCJPA management to explore which extension of service would best meet transportation needs along the corridor, and the Capitol Corridor’s equipment and service pattern best fit the desired operating needs.

An expansion of service to Salinas will only be possible once the Phase Two service expansion between Oakland and San Jose is implemented. The new Monterey County service would require two additional train sets. Other capital costs include a phased upgrade to stations along the route and track-infrastructure upgrades. Existing plans would have service launch with two daily round trips between San Jose and Salinas, and the eventual goal is expand to as many as six. This extension is not yet adopted by the CCJPA Board but is included here as a significant governance and service modification to Capitol Corridor that must be considered in the vision planning process.

Table 3-3 Monterey County Service Extension

Phase	Status	Frequency Gain	Funding Secured	Funding Need Estimate
Salinas Extension	Planned	2 round-trips	\$45 million	\$175 Million

Other Service Extension Options Considered

Over the last 15 years, Capitol Corridor has explored a possible service expansion east of Auburn, to Reno, Nevada. The idea was largely driven by the natural linkage between the Bay Area and seasonal recreation opportunities in the communities in and around Lake Tahoe. Prior studies dismissed the idea because of the frequency of freight rail trips in the corridor, and freight rail use has actually increased since the idea was last studied in detail. The idea also faces political and funding challenges. Adding this to the Capitol Corridor’s short-term plan would require a significant change in political priorities driven by an event like a successful Reno-Tahoe Winter Olympics bid. This potential extension is not considered further in the vision planning process due to the inherent travel and market barriers previously analyzed.

Short-Term Service Amenities

The Capitol Corridor has introduced two major new station and on-board amenities since the 2005 Vision Plan: e-ticketing and free passenger Wi-Fi. This version of the plan aims to build on these improvements to keep Capitol Corridor service as comfortable and convenient for passengers as possible.

The plan includes a comprehensive on-board information system (OBIS). The Capitol Corridor and the Caltrans Division of Rail are in the early stages of working with a vendor selected by Amtrak (CCJPA and Caltrans were on the selection team) for OBIS implementation. An OBIS will feature a mixture of automated video and audio communications to provide real-time travel updates, station arrival information, and alerts. The system will also allow the CCJPA to use screen space for advertising, service promotions, and upcoming service alerts. Each car in the fleet and any cars added to the fleet will be retrofitted to include these upgrades over time, with implementation starting this year.

The system will also continue regular Wi-Fi system updates. Future updates could include features that would provide digital media content (movies, television, and games) via the network. Digital media rights and delivery systems are, like technology, evolving quickly, and it is likely that a company will create a viable business model for delivering digital media to train customers in the United States in the near future. CCJPA plans to remain actively engaged with Amtrak and digital-media content providers on this front in the future.

The plan also includes bicycle-access improvements at stations and on trains. Bicycles are a growing access mode for the system, and existing train cars are not always able to accommodate the increased levels of demand. In the last few years, Caltrans helped modify some train-car models to nearly double available bicycle parking. Projected increases in bicycle demand will require similar modifications to additional cars in the Capitol Corridor’s fleet. The CCJPA will also work to improve bicycle infrastructure at stations. The authority’s Bicycle Access Plan included the introduction of secure lockers and folding bicycle rental services, both of which will create more options for bicyclists. Installation of these amenities will start in early 2015, and further expansions will happen as demand warrants. The Capitol Corridor will also support local communities’ efforts to expand bike sharing to the system’s stations.

MEDIUM-TERM PLAN

The medium-term plan is comprised mostly of expansions that build on those included in the short-term plan service.

Oakland to San Jose Service Expansion: Phase Three

Building on the Phase Two service expansion, Phase Three would allow all 15 daily round trips between Oakland and Sacramento to serve the whole corridor, reaching San Jose. The exact mix of infrastructure improvements required for such an expansion will require further study, but they would likely include double- or triple-tracking the segment running over the Alviso Wetlands, which currently only includes a single track. Designs will need to be mindful of future sea levels and the surrounding wetlands (see the section addressing this issue in Chapter 4). Given the sensitive environment, this phase will likely require a detailed environmental review and significant mitigations, and design and engineering for this segment are likely to be challenging. Further analysis as described after the long-term vision section will direct the nature of the improvements so that an effective capital investment strategy can be applied over time.

Table 3-4 Oakland to San Jose Frequency Expansion Table – Phase Three

Phase	Status	Frequency Gain	Funding Secured	Funding Need Estimate
Phase Three	Planned	11 to 15 round-trips	\$0	\$210 Million

Placer County Service Frequency Expansion

Building on the projects included in the short-term plan, service expansion in Placer County will likely require a station relocation and the construction of a third mainline track, with several track crossovers along the right-of-way. It will also likely require a new American River bridge crossing. Environmental review is currently underway, and while design is more of less established for the exact linear alignment and bridge elements required for this project a phasing process related to

funding will help define the remaining phased construction required after the implementation in the first or early phases as described in the short-term section above.

Table 3-5 Placer County Service Expansion

Phase	Status	Frequency Gain	Funding Secured	Funding Need Estimate
Roseville Expansion	Planned	5 to 10 round-trips	\$0 Million	\$100 Million

Monterey County Service Expansion

Medium-term projects will build on short-term projects in the corridor between San Jose and Salinas, growing service to six daily round trips. As with the short-term plan’s reliance on Phase Two Oakland-San Jose improvements, the medium-term plan’s service expansions would likely require Phase Three improvements. The medium-term expansion in the area will also require a complete operational analysis, considering additional rolling stock needs and capital-improvement requirements.

Table 3-6 Monterey County Service Extension

Phase	Status	Frequency Gain	Funding Secured	Funding Need Estimate
Salinas Extension	Planned	From 2 to 6 round-trips	\$0 million	\$200 Million

Medium-Term Service Amenities

Given the pace of technological innovation, it would be futile to plan for specific technology-related amenity improvements in the 10- to 20-year timeframe however the concept of maintaining a data pipe connection to and within the moving train will remain a core necessity. CCJPA must simply be ready to update passenger amenities to keep pace with changes in the way customers work and entertain themselves. Ticketing is one area in which train travel is likely to evolve in this period, potentially making tickets more versatile or customizable to better match both customer and revenue objectives and also mesh with the larger state-wide objectives for blending passenger rail services.

Demand for other amenities, such as food service, bicycle storage, and customer communications will likely grow as the service evolves and ridership changes over time. The maturation of Northern California’s blended passenger rail system and California High Speed Rail are also likely to require additional investments in station and on-board amenities, to make the passenger experience consistent across operators.

Medium-Term Speed-Related Improvements

The following chapter describes the Capitol Corridor’s long-term plan. The alternatives described in the chapter are “build-out” concepts that would be implemented incrementally over a long period. An implementation strategy including a project timeline will be developed following adoption of this Vision Plan Update which will include identification of a cost effective capital

investment plan which maximizes the public investment in the service, however some investments will clearly not be as beneficial as others. It is clear, however, that initial steps could be taken upon completion of the short-term plan (or earlier, depending on available funding and political support).

One key policy decision that will have to be made in developing an implementation strategy will be the extent to which speed- and capacity-related improvements should be made to segments that would eventually be abandoned. Cost-benefit analysis will need to be conducted to determine the value of such “throwaway” investments; it might make sense, for example, to make low-cost improvements with substantial benefits to a segment that will eventually be abandoned, but not for some time. This analysis will be contained in the Vision Implementation Plan outlined below and this plan will serve as the companion to this Vision Plan Update.

4 LONG-TERM PLAN

The long-term plan lays out a vision for making the Capitol Corridor a fast, reliable, comfortable, and convenient transit spine for the Northern California Megaregion. It looks at potential investments that could be made over the next 40 or 50 years, and while many of the potential projects outlined below would require significant capital expenditures, finding funding for such large expenditures is reasonable over the course of this long timeframe. It is critical that the CCJPA and its partners agree on a long-term plan for the service to ensure that investments made in the short and medium terms align to this vision.

As mentioned previously, and as will be discussed below, a next step in the planning process will be to examine in detail the short-, medium-, and long-term capital investments covered in the companion to this Vision Plan Update, to identify preferred improvements, and to identify the sequence in which they should be implemented.

This section lays out the principles and objectives that undergird the plan, the general options for meeting these objectives, long-term environmental issues that must be a top consideration of any long-term investments, and sketch-level alignment alternatives for each segment of the route. A noted departure from the short- and medium-term plan is that the long-term plan is largely predicated on the Capitol Corridor obtaining right-of-way so that it is generally no longer a tenant to a host railroad and instead dictates its own service destiny.

PRINCIPLES AND OBJECTIVES

The Capitol Corridor has the potential to be the transit spine of the emerging megaregion comprised by the Sacramento metropolitan area and the Bay Area. There are strong economic linkages between the two regions today, and the regions' combined population of 9.6 million is projected to grow another 2 million by the middle of the century. A strong transit link is critical given existing congestion on roadway connections between the regions and the superior carrying capacity of passenger rail, relative to private-vehicle travel, in constrained corridors.

To maximize the Capitol Corridor's role as a transit spine, the service will need to meet several other objectives:

- *Integrate seamlessly with both regions' rail systems:* Capitol Corridor service should integrate seamlessly with BART, Caltrain, VTA light rail, ACE, and Sac RT light rail. Such links could be made easier and more convenient. For example, a new BART transfer opportunity at West Oakland would make travel to and from San Francisco destinations much faster and more convenient than today. Where these links already exist, fare and scheduling policies should be adjusted to make using more than one system for a single journey a more seamless process.
- *Upgrade to modern international railroad standards:* Delays related to freight train priority and dwell times are a notable cause of speed and reliability problems on the

service today. Acquiring right-of-way to give Capitol Corridor service priority and upgrading stations and train cars to allow for level boarding are two ways to bring the service in-line with international standards for high quality passenger rail service. Another is electrification using an overhead contact system, which in addition to rendering trains cleaner and quieter would allow for faster acceleration and deceleration.

- *Make service faster in phases based on FRA limits:* Trains currently travel an average of approximately 40 miles per hour through the Capitol Corridor route and only reach higher speeds through the straightest segments. They are legally allowed to travel up to 125 miles per hour with at-grade crossings, and they can reach even higher speeds in areas with grade separation and other safer infrastructure arrangements. It will require a combination of right-of-way acquisition, alignment straightening, vehicle upgrades, and, ultimately, grade separation to take advantage of this potential. Infrastructure investments should aim to steadily increase speeds.
- *Make service more customer-friendly:* Service should become more frequent, more reliable, cleaner, and quieter over time. Improvements in these areas will require a combination of infrastructure and vehicle improvements. Increasing speeds will also allow for scheduling built around clockface pulses at hubs, a scheduling approach that is more intuitive for customers.
- *Protect the corridor from the threats of sea-level rise:* Large stretches of the alignment run along waterfronts, through marshland, or on soils that are increasingly vulnerable to liquefaction in the case of a major seismic event. Any investments must decrease the service's vulnerability to projected changes in the environment.

The alternatives below reflect these goals and objectives.

TOOLBOX

Today, a one-way trip from Sacramento to San Jose takes, at best, 3 hours and 8 minutes. Trains are not the biggest speed-limiting factor: Capitol Corridor locomotives have a top speed of 110 miles per hour, and if they were able to travel that fast through large portions of the corridor, travel times would be close to those outlined in the long-term plan objectives. Physical and regulatory limitations, including tight curves, conflicts with freight trains, at-grade crossings, signal systems, bridges that lift for marine vessels, and a lack of automatic safety controls, limit trains to much slower speeds. In fact, while Capitol Corridor trains can legally only travel as fast as 79 miles per hour, per regulations and UPRR restrictions, their average speed through the corridor is only about half that, 42 miles per hour.

Reducing travel times will require a combination of increased top speeds and fewer (and shorter) delays. There are a number of ways to accomplish this and this section details the options – it should be noted, however, that not all may be a good fit. The long-term plan alternatives described later in the chapter, include many of these approaches, from which the most applicable will be selected.

Positive Train Control and Speed Increases

Positive Train Control (PTC), which is in the process of being installed on Capitol Corridor trains right now and is soon to be installed by the host railroads, links every train in a system to a central computer which can set rules for where trains can be in relation to each other and control train

movements to prevent them from getting too close. The technology has the potential to significantly increase speeds, even without costly infrastructure changes, though there is concern that it could potentially slow average speeds immediately after implementation as PTC is optimized for operations in the particular corridor in which it is implemented. When PTC is installed, the Federal Railroad Administration allows trains to reach 110 mph even without “sealing” at-grade crossings.

Amtrak trains in Michigan have installed PTC and have been allowed to reach top speeds of 110 miles per hour, though the line on which it was installed is not as heavily integrated with freight rail services. The FRA is currently working to improve the reliability of the technology for rights of way with both passenger and freight traffic.

Tilting Rolling Stock

The Capitol Corridor’s trains cannot physically go faster than 110 mph, and they must slow down dramatically around tight curves like those along the shoreline between Martinez and Richmond. Allowing train cabins to tilt when going through curves can reduce the effects of centripetal forces on passengers, making higher speed trips around curves more comfortable. Amtrak’s Cascade service between Seattle and Portland uses Talgo tilting trains, which allow for higher speeds through curves, and America’s fastest trains, on the Amtrak *Acela* between Boston and Washington, D.C., similarly rely on tilting technology.

Given heavy investment in the Capitol Corridor’s current train fleet, it is unlikely that the CCJPA will pursue tilting technology in the near term. Still, this could be an option for marginally increasing speeds when purchasing new vehicles is necessary.

Electrification

Powering trains using electricity, transferred to individual rail cars through overhead wires, also has the potential to cut travel times by enabling higher speeds and reducing acceleration and deceleration time. Capitol Corridor trains are currently powered by diesel locomotives, which are heavier and thus require more time to speed up and slow down. Electric multiple unit (EMU) railcars are also cleaner and quieter than diesel trains.

As with tilting technology, electrification would require replacement of the Capitol Corridor’s entire train fleet. While this would require a significant capital investment, it could reduce operating costs over time, if fuel prices continue to rise.

Under FRA regulations, lightweight EMUs cannot share tracks with heavier equipment like freight trains, and even if these regulations were amended, UPRR would have to agree to shared operation of the corridor. As such electrification would likely require constructing separate passenger-only tracks within existing UPRR rights-of-way.

Caltrain is planning to electrify its system by 2020, and the Altamont Corridor Rail Project will eventually electrify Altamont Commuter Express service, allowing speeds up to 150 miles per hour in some segments. Electrification costs can vary widely. Caltrain’s electrification project, which will also include PTC and 112 new railcars, is projected to cost roughly \$30 million per mile. However, it is projected to reduce operating costs by more than 40 percent.

Straight Lines and Super-Elevation

Because trains must slow down through tight curves, the most basic way to increase speeds is to simply straighten out a route's alignment. This approach seems daunting when considering an entire route, but straightening short segments can lead to significant overall travel-time reductions. Segments with necessary curves can be sped up slightly by tilting or banking tracks to the characteristics of a given curve – called “super elevation” – in much the same way as National Association for Stock Car Auto Racing, more popularly known as NASCAR tracks' curves are banked to allow race cars to travel at high speeds.

Geography and settlement patterns can often make straightening alignments quite expensive. For example, straightening the Capitol Corridor segment between Richmond and Martinez stations would require either significant tunneling or several new bridges. Similarly, straightening the segment between the Oakland Coliseum and Emeryville, which includes a tight northbound turn, would require either a deep-bore tunnel under densely populated parts of Oakland or unrealistic levels of right-of-way acquisition. Still, there are likely areas along the Capitol Corridor alignment that would be good candidates for straightening or super-elevation treatments.

Express Train Service

With speed lost in the acceleration and deceleration and dwell time at stations, stops can add significantly to travel times through a whole route. As such, creating express or limited services is an effective way to reduce travel times. Caltrain has used this approach to significantly reduce travel times through the Peninsula corridor, reducing end-to-end travel times from more than 90 minutes to less than an hour by skipping 17 of the line's 23 stops between San Francisco and San Jose. Of course, the Capitol Corridor has many fewer stops than Caltrain, so travel-time reduction benefits of express service would be much more limited. In addition, given the wide spacing between stops on the line and the Capitol Corridor's lower frequencies, reducing the number of stops on some runs would affect a notable share of riders. For both of these reasons, the utility of limited-stop service may be much lower for the CCJPA.

RESPONDING TO CLIMATE CHANGE AND SEA-LEVEL RISE

The Capitol Corridor has a complicated relationship with the San Francisco Bay. The route's proximity to marshland, tidal waters, and the bay-shore make the ride picturesque. However, in an era of rising sea levels and increasingly frequent strong storms, that proximity may threaten large segments of the corridor's physical infrastructure. The route has the most linear exposure to this threat of any transit service provider in the Bay Area. As the CCJPA considers investments that will create the next generation of Capitol Corridor service, it must also ensure that the service's capital assets are well positioned to weather the effects of climate change.

The corridor is already vulnerable to environmental factors. In the East Bay, large portions of the alignment and an important maintenance facility sit on land subject to liquefaction in case of an earthquake. Tracks that run through the Suisun Marsh, in the Central Valley, already require significant ongoing maintenance due to high groundwater levels. Rising water tables, associated with sea-level rise, will only make both of these problems worse.

It is critical that CCJPA consider sea-level rise in all of its planning decisions because some will commit the Capitol Corridor to a particular set of future adaptation responses. For example, the CCJPA anticipates that the City of Hercules will soon ask the agency to consider a new station in an area that is particularly vulnerable to rising sea levels, along the existing alignment next to San

Pablo Bay. Such a station and any associated track infrastructure would need to be built to weather the effects of sea level rise, and its location could commit the railroad to an alignment that is more difficult to gird against the effects of rising waters.

The CCJPA recently completed a Sea-Level Rise Vulnerability Assessment. This section summarizes the major issues raised in that assessment, to provide context for some of the alternatives presented in the next section.

Overall System Vulnerabilities and Recommendations

The Capitol Corridor faces significant system-wide vulnerabilities, many of which will make preparing the system for higher sea levels more difficult. Among the biggest issues is the railroad's relationship to its right-of-way and many of its assets: The CCJPA manages a service that runs on other entities' tracks and a mix of agencies and local jurisdictions have dominion over different parts of its stations and other capital assets. How the CCJPA manages these relationships, and how closely it can coordinate planning among these many players, will be a key factor in determining how successfully Capitol Corridor service can confront the coming environmental challenges.

The most critical vulnerabilities highlighted by the sea-level rise assessment:

- **Track, railroad bed, and signals:** Outages in segments of the Capitol Corridor's alignment would likely affect operations along the entire route, and important parts of the linear infrastructure on which the railroad relies would be inoperable with water damage. Rails can warp and corrode and track beds can destabilize with sustained exposure to standing water or the strong wave action associated with storm surges. The electrical systems that ensure safety along the right-of-way, many of which run under the railroad bed, are vulnerable to even slight exposure to moisture. Large segments of the alignment are quite vulnerable to these threats, particularly with just slight increases in sea levels or strong storms whose frequency is expected to increase over the coming years.
- **Oakland Maintenance Facility:** Maintenance work on all Capitol Corridor trains occurs at the Oakland Maintenance Facility, which sits on soil that is subject to liquefaction in an earthquake and is just a few feet above sea level today.
- **A lack of information on railroad assets:** The CCJPA does not currently have an internal understanding of the state of essential railroad assets owned by the UPRR or other partners. UPRR may have an internal database with information on the age and state-of-good-repair of tracks, signals, and other critical pieces of infrastructure, but it has not shared this information with the CCJPA to date. This lack of information makes planning for these issues much more difficult.
- **Complicated Institutional Arrangement:** Related, the tens of entities and jurisdictions with which the Capitol Corridor interacts along its 171 route miles makes any kind of planning work quite complex. While this presents an opportunity for cost-sharing and mutually beneficial investments, the administrative challenges and costs associated with aligning organizations with different values and priorities could be a critical vulnerability.

Based on these vulnerabilities and others, the sea-level rise assessment made a number of recommendations, many of which focused on institutional steps the agency must take to better prepare for climate change. The recommendations included building an internal database of critical capital assets, working with UPRR to gain access to information on the current condition

and maintenance history of those assets, as available. In addition, it also recommended that long-term plans take sea-level-related threats along different segments of the alignment into account and that the agency create short-term operational contingency plans for vulnerable segments. Such plans might include bus bridges and other interim measures to keep some level of service running after major flooding.

Issues by Segment

The assessment also catalogued major issues facing different segments of the alignment that are particularly vulnerable to climate-change-related impacts to provide deeper context for the segment-by-segment alignment alternatives.

Southern East Bay to San Jose

The alignment runs directly through bay lands and tidal areas in this segment, and as such, is subject to inundation with just slight increases in sea-level rise. A five-year-storm tide level – with 20percent likelihood in any given year – would also flood the most exposed portions of this segment.

Oakland Coliseum Area

Three feet of sea-level rise would inundate tracks in this segment, and the segment between Lion Creek and 73rd Avenue, just northeast of the Coliseum complex, is particularly vulnerable to liquefaction.

Oakland-Richmond

Tracks around the Lake Merritt Channel, the lowest portion of this segment, are subject to permanent inundation with three feet of sea-level rise or a 25-year storm event, which has a 4percent chance of happening during any given year. Other portions of this segment would be inundated with four to five feet of sea-level rise. The whole area is subject to liquefaction in an earthquake.

Point Pinole

Tracks in this segment wind along the shoreline of Carquinez Strait and San Pablo Bay and, as such, are particularly vulnerable to storm surges and strong waves, and tracks would be vulnerable to such conditions more frequently with an increase in sea levels. Railroad beds could wash out with strong waves in this segment, and a series of bridges in this segment, rising over inlet creeks, could also be vulnerable to flooding.

Martinez Area

Tracks in the segment risk permanent inundation with four feet of sea-level rise and are vulnerable to the strongest of storms seen in the historical record for the area, or a so-called 100-year storm. Such an event has a 1percent chance of happening in any given year. The Martinez station is the fourth busiest in the Capitol Corridor system, and as such, disruptions would have a major impact on existing users.

Suisun/Fairfield Area

A large share of the right-of-way in this segment runs through Suisun Marsh, a wetland in which soil subsidence is already the cause for significant track maintenance activity. Tracks in this

segment, as they are currently constructed, risk permanent inundation with as little as two feet of sea-level rise and are subject to temporary flooding in case of a storm of a strength expected every five years.

PROCESS

To advance the conceptual vision outlined in the draft 2013 update, a process for this Vision Plan Update was developed by CCJPA staff and consultants. This process took the fundamental principles and objectives identified in the draft 2013 update as a starting point, and asked: What level of alternatives development and analysis would be necessary to create a “roadmap” detailed enough to allow specific, early-stage projects to be advanced?

As it was ultimately carried out, this process consisted primarily of:

- *Development of segment-based travel time “targets” for “low,” “medium” and “high” investment and travel time savings scenarios.* Reflecting one of the key principles identified in the 2013 update – “clockface” arrival and departure times at major hubs – the low scenario was based on travel time of 1 hour, 45 minutes between Sacramento and Oakland and 1 hour between Oakland and San Jose (roughly a 10-12 percent reduction from current travel times). The medium scenario was based on travel time of 1 hour, 15 minutes between Sacramento and Oakland and 45 minutes between Oakland and San Jose (roughly a 30-35 percent reduction from current travel times). The high scenario, meanwhile, was based on travel time of 1 hour between Sacramento and Oakland and 30 minutes between Oakland and San Jose (roughly a 50 percent reduction from current travel times). Reflecting the different geographic and land use conditions within the Sacramento-Oakland segment, target travel times were also developed for sub-segments consisting of Sacramento to Suisun City, Suisun City to Richmond, and Richmond to Oakland. The high scenario was used as the basis for the alternatives development and travel time analysis in the following steps, while the medium and low scenarios were intended to serve as a basis for development of a phasing strategy.
- *Identification of capital improvements that might be used to achieve these targets, analysis of potential travel time savings for each improvement, and packaging of improvements into alternatives for analysis.* This phase of the process is described in detail in the following section.
- *Development of conceptual schedules and ridership forecasts for each alternative.* This phase of the process is described in detail in the following section.
- *Order-of-magnitude capital cost estimation for major improvements, or types of improvements.* These too are currently in development.

Originally, two additional steps were envisioned: selection of a preferred alternative, and a phased implementation strategy based on cost-benefit analysis. However, it was ultimately determined that this step should be deferred until additional outreach to partners, stakeholders and communities can take place, and some consensus can be developed around a preferred alternative that is not only technically sound but politically acceptable (this is further discussed in Chapter 6).

Next Steps).

The process also included presentations at key decision points to the CCJPA Board of Directors Ad Hoc Vision Plan subcommittee.

CONCEPTS BY SEGMENT

Each segment of the Capitol Corridor route presents unique challenges and opportunities. This section reviews the conceptual capital and alignment alternatives developed for this study, starting from San Jose in the south and continuing to Sacramento (segments farther to the south and north will be the subject of separate future analysis).

The alternatives were developed based on analysis of engineering feasibility and potential travel time savings. As this was largely a technical exercise designed to identify the full range of available options, political, cost and other considerations were not a major factor. These issues will be addressed in the next phase of project development (see Chapter o,

Next Steps).

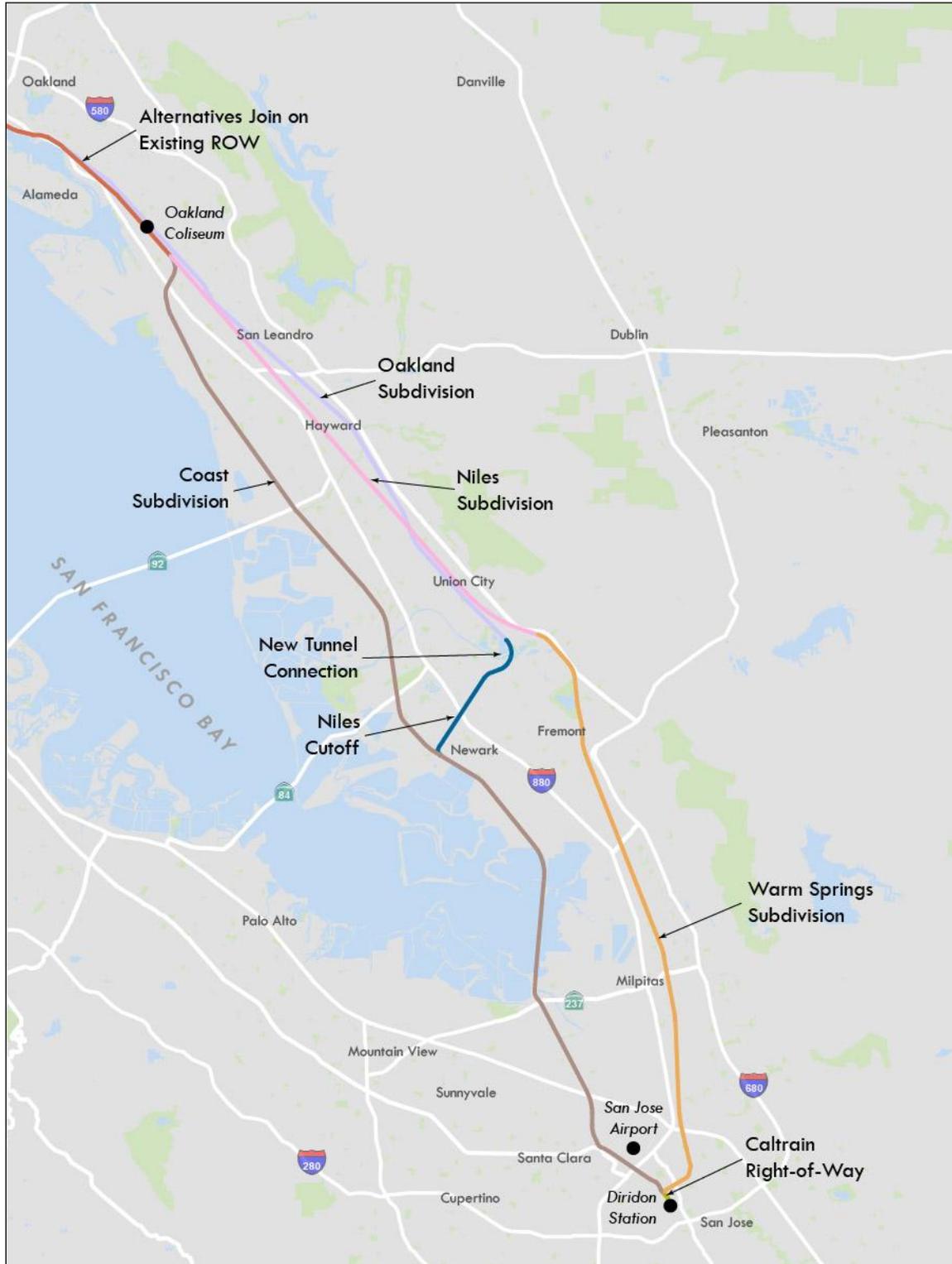
All alternatives assume eventual development of a double-tracked, electrified, dedicated right-of-way for use by passenger trains. In some segments, new ROW would be developed, while in others passenger tracks would be added in shared ROW. In these segments, separation of 25 feet between freight and passenger track centerlines was assumed, consistent with standard UPRR requirements. The key factor will be that Capitol Corridor service will, in general, not be on tracks in the control of a host railroad.

San Jose-Oakland Coliseum

Speed and capacity were identified as the key issues in the southernmost portion of the corridor. Large stretches of this segment have only a single track, limiting maximum speeds, operational flexibility, and service frequencies.

Today, the alignment travels north from San Jose Diridon Station for 2.5 miles on Caltrain-owned right-of-way before switching to UPRR right-of-way just north of Santa Clara station. It follows the UPRR's Coast Subdivision into Fremont, where it uses the Niles Cutoff to transition to the Niles Subdivision for its route to Oakland. Figure 4-1 shows the alternatives developed for this segment.

Figure 4-1 San Jose-Oakland Alignment Alternatives



Coast Alignment

The Coast Alignment would have the line follow the Coast Subdivision up the bay shoreline to just south of Davis Street in San Leandro. The segment would be acquired from the UPRR and converted to a double-track passenger-only line. Track would be laid out within the right-of-way to flatten curves as much as possible. To connect to the Niles Subdivision for the trip north of this segment, the alignment would sink into a tunnel under I-880 at Hegenberger Road, joining the Niles Subdivision just south of the Oakland Coliseum. An alternative would be to tunnel under 98th Avenue to connect with the Oakland Subdivision, and then join the Niles Subdivision at 47th Avenue in Oakland. This alternative would require the acquisition of an additional 30 to 40 feet of right of way for the 6.5-mile trip to Jack London Square. Portions of this alternative that use the Coast Subdivision would need to be constructed to account for sea-level rise and storm tides.

Inland Alignment

The Inland Alignment would leave San Jose Diridon Station via the Warm Springs Subdivision, which travels around the southeastern end of San Jose Airport, through the northwestern portion of Downtown San Jose, through Milpitas, and into Fremont between I-880 and I-680. A double-track passenger line would be constructed in this portion of the alignment. It would then follow the Niles Subdivision to Jack London Square. The Capitol Corridor would share the right of way with freight trains on a reconstructed version of the UPRR main track, which would shift toward one side of the right-of-way with 10,000-foot passing sidings constructed every three to five miles. The siding locations would require a significant amount of additional right-of-way. The northernmost portions of this alignment would need to be constructed with sea-level rise in mind.

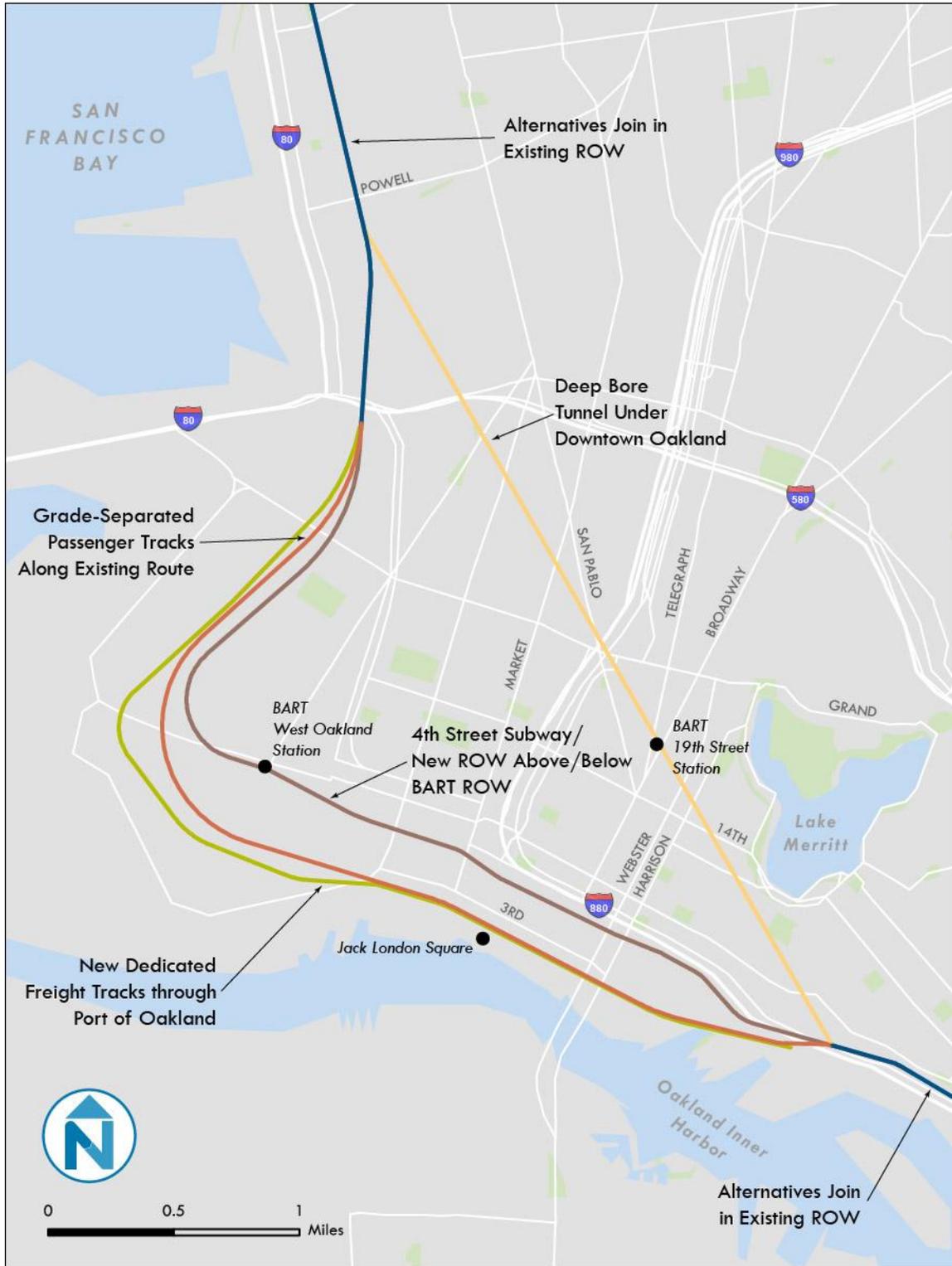
Hybrid

A third option would follow the Coast Subdivision from the Caltrain alignment to Newark, connecting on the Niles Cutoff to the Oakland Subdivision, on which the route would travel through just north of the Coliseum in Oakland. The portions of this alternative that use the Coast Subdivision would need to be constructed to account for sea-level rise and storm tides.

Oakland

Changes to the right-of-way in Jack London Square are of critical importance. Trains currently operate in the street, which is neither safe nor efficient, but the Posey and Webster tubes, just south of Jack London Square, are too shallow to allow a subway under the current alignment. In short, there are no inexpensive options for fixing this portion of the alignment. Figure 4-2 details how potential grade-separated alignments through Central Oakland could work.

Figure 4-2 Alignments through Central Oakland



Grade-Separated through Jack London Square

One option would travel through Jack London Square on passenger-only tracks through a right-of-way shared with freight, with appropriate safety treatments, that is either at grade or partially lowered. Embarcadero Street would be closed from Martin Luther King Junior Way to Webster Street, with Water Street extended from Clay Street to Martin Luther King Jr. Way to facilitate continued vehicle access to the area. Martin Luther King Junior Way and Market Street would both have grade separated track crossings, while Jefferson, Clay, Washington, Franklin, and Webster streets and Broadway would dead-end at Embarcadero. Existing roadways north of the right-of-way would give direct access to a new parking facility under the right-of-way, and a pedestrian esplanade over the tracks would continue to provide pedestrian access through the area.

While this would be the lowest-cost option for grade-separating the right-of-way through the Jack London area, it would result in a physical and visual barrier between Jack London Square and the rest of the District. Additionally, it would impact existing land uses on Embarcadero itself.

5th Street Subway

A second option would be to have the alignment turn slightly to the north just east of I-880, traveling in a subway or on an elevated guideway along 5th Street. It would then join a new right-of-way along the BART alignment through West Oakland, potentially on a viaduct. This would facilitate BART connections at a new West Oakland Station adjacent to or near the existing West Oakland BART Station. (Through its Vision Plan process, BART is currently studying a new intermodal station where the existing Capitol Corridor and BART rights-of-way intersect.)

While this option would have far less of an impact than grade-separation of the existing alignment, it would be substantially more expensive, and further analysis would be needed to confirm that a new rail viaduct could pass beneath the existing I-880 viaduct without substantial reconstruction of the latter.

Tunnel Under Downtown Oakland

A third option would construct a deep-bore tunnel under downtown Oakland, starting just east of the Lake Merritt Channel and rejoining the UPRR right-of-way just north of I-580 in Emeryville. This would require boring a tunnel roughly 3.5 miles in length. This would facilitate BART connections at 19th Street in downtown Oakland. It would be by far the most expensive alternative for this segment.

Oakland-Richmond

This segment of the corridor is among the most heavily congested rail corridors in California, leading as it does from the Port of Oakland to inland destinations, through a densely urbanized area. However, as a practical matter, no alternative at-grade alignments are available. For this reason, analysis in this segment was limited to the physical requirements for creation of dedicated passenger tracks. Given the 100-foot existing right-of-way in this area, acquisition of 20 to 30 feet of right of way between Grand Avenue and 65th Street could be required.

While the alternatives were developed based entirely on technical analysis, without physical constraints, it is clear that any ROW acquisition in this heavily urbanized corridor would require the participation of multiple partners, including the Capitol Corridor and UPRR as well as potentially others such as BART, MTC, and the State.

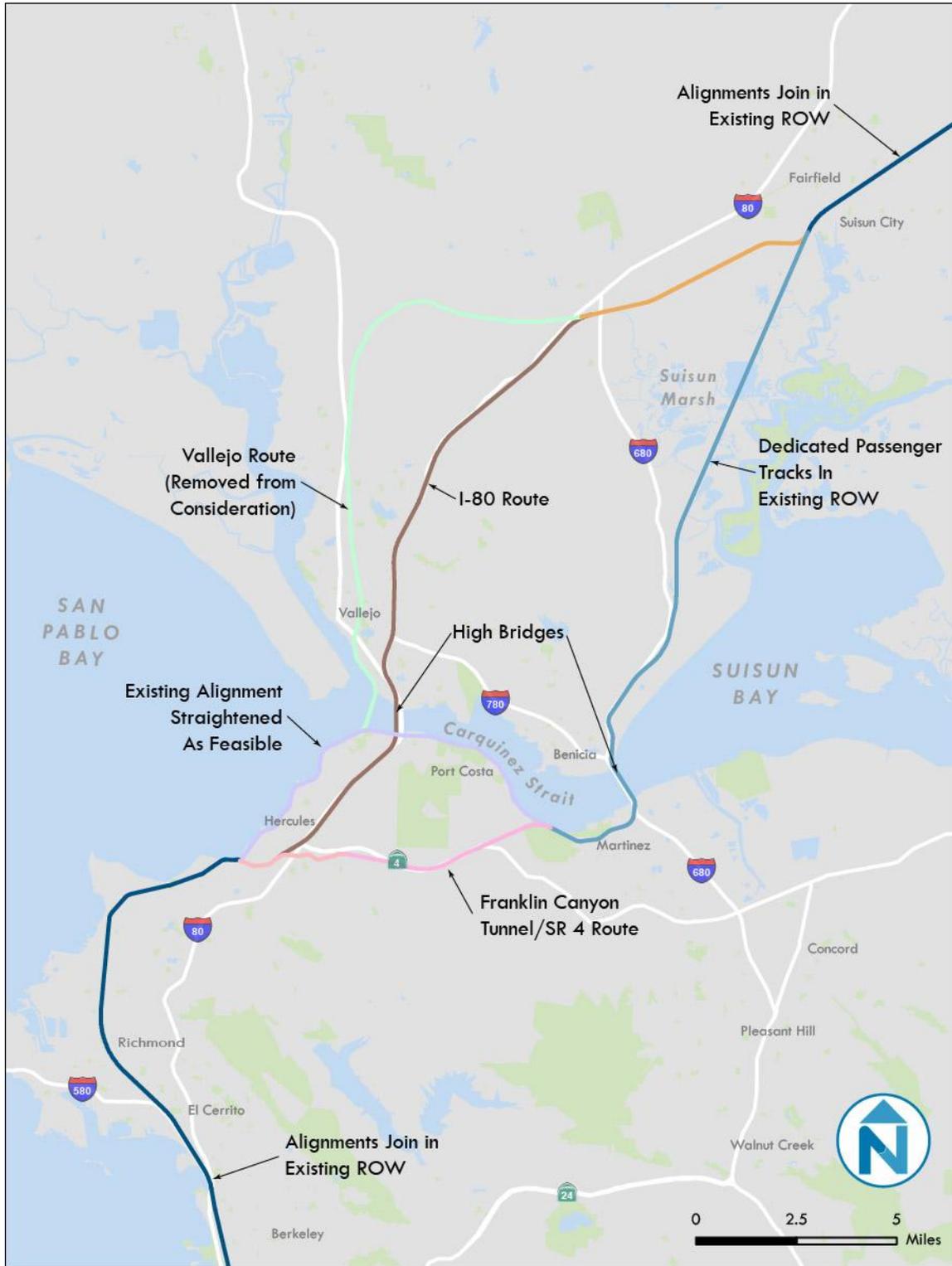
One alignment alternative at the southern end of this segment that was not assessed in depth but has been identified through other processes including the Regional Rail Plan and BART Vision Plan effort is a new underground alignment beneath Mandela Parkway in West Oakland, connecting to a new Transbay Tube with standard-gauge tracks in addition to tracks for BART. This would allow for a new subway station immediately below or adjacent to the existing West Oakland BART Station.

Richmond-Suisun/Fairfield

The segment between Richmond and Suisun is perhaps the most challenging to speed up and protect from sea-level rise. Running on UPRR right-of-way, it follows a winding route along the shores of San Pablo Bay and Carquinez Strait before crossing a vertical-lift bridge over the Suisun Point Channel. The alignment then runs through Suisun Marsh to Fairfield. The route is rather indirect, and the large number of curves slow trains significantly through this part of the corridor. In addition, the right-of-way's position right on a shoreline makes it particularly susceptible to storm surges in the short term and sea-level-rise over the long-term. The bridge, which halts train traffic for any shipping traffic through the channel, creates significant reliability issues.

Figure 4-3 shows the three major alternatives for improving this portion of the corridor. On the southern end of this segment, each alternative would join the BNSF Stockton Subdivision just north of Richmond, allowing for a more direct route. On the northern end, each one would include a new high-level crossing near the Carquinez or Benicia/Martinez bridges, to deal with the current bridge-related reliability issues.

Figure 4-3 Richmond-Suisun/Fairfield Alternatives



Improve Existing Alignment

One alternative would reconnect with the existing right-of-way just north of Hercules. Curves would be flattened to the extent possible and the alignment would be raised to protect against rising water levels. This alternative would connect to a high-level crossing just east of Martinez. While this alternative has the potential to be least expensive because it requires no tunneling or right-of-way acquisition, it could still require significant time and money to study and mitigate the environmental impacts and gain the approval of numerous agencies, given that it would involve heavy construction right on a sensitive shoreline.

Franklin Canyon Tunnels

A second alternative for this segment would follow the BNSF alignment, turning inland at Hercules and joining Highway 4 in Franklin Canyon via a new 1.3-mile tunnel. A Hercules Station would be at the Hercules Transit Center, rather than the Hercules New Town Center. After following Highway 4 for nearly 2 miles, it would enter another tunnel, traveling 2.7 miles before reconnecting with the existing alignment in Martinez. To reach a new high-level crossing running parallel to the Benicia-Martinez Bridge, the route would need rise for 1.9 miles on an elevated guideway through Martinez within the existing right-of-way. On the north side of the crossing, the route would tunnel under I-680 to rejoin the existing right-of-way.

Vallejo

This alternative would follow the BNSF Stockton Subdivision for 4.5 miles before running elevated or at grade down the center of the I-80 right-of-way through Vallejo, then next to it through Jameson and American canyons, connecting back to the existing alignment in Suisun City via the California Northern right-of-way. This alternative would require a complete reconstruction of I-80. Another Vallejo alternative would pass through the heart of the city via an existing, extremely constrained rail right-of-way. Both of these options are viewed as unlikely for reasons of both cost and impact.

High-Level Crossing

Analysis suggests that the most promising alignment for a new, more reliable high-level crossing of the Carquinez Strait would be parallel to the existing crossing, which is itself between the twin spans of the Benicia-Martinez (I-680) auto bridge. This is largely because a new bridge could connect at its southern end to the existing alignment, which in turn was found to be a more promising connection point than an I-80 alignment through Vallejo (see above).

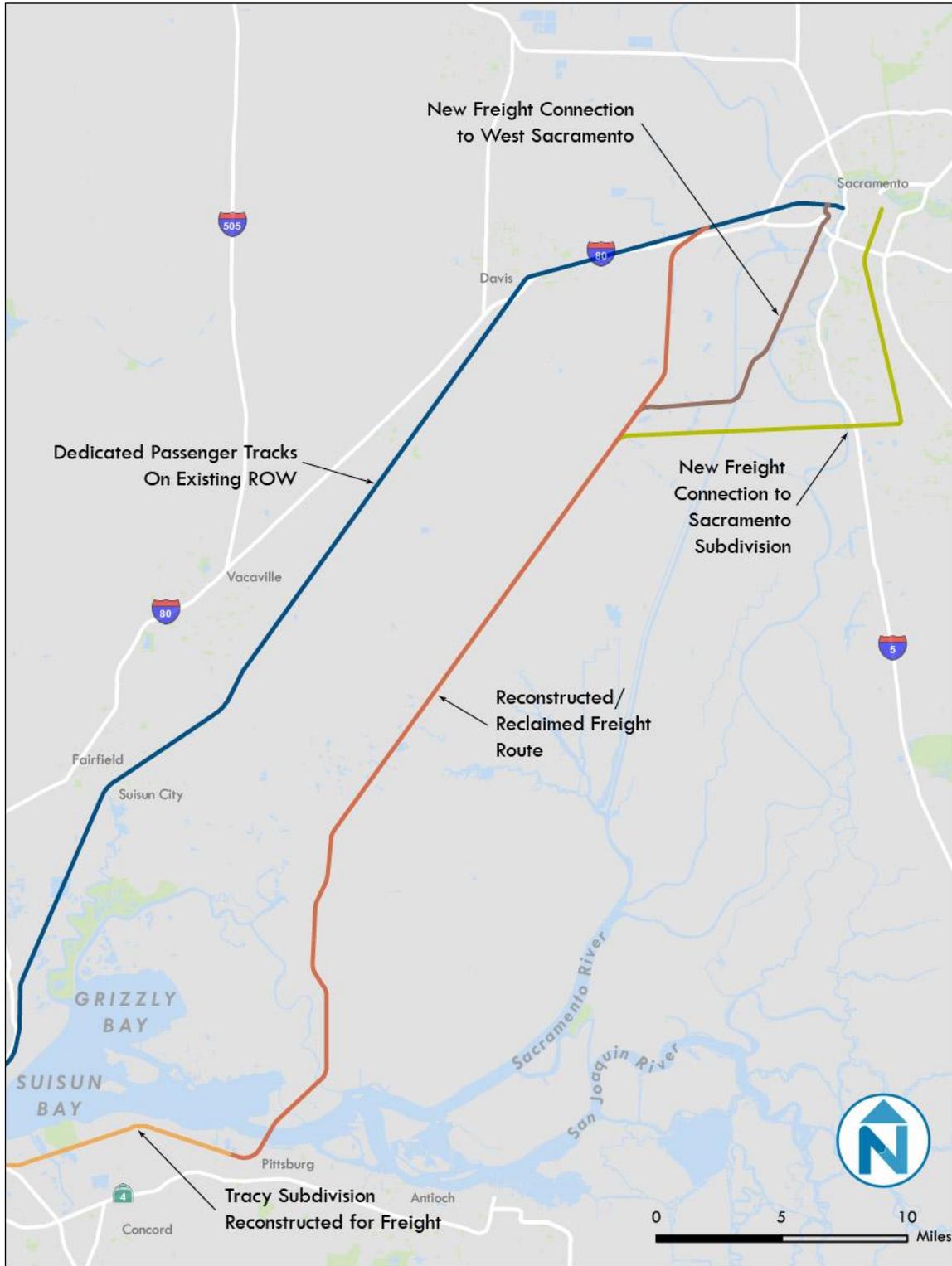
Suisun/Fairfield-Sacramento

Interactions with freight traffic are the most significant impediment to speedy service in the segment between Suisun/Fairfield and Sacramento. The alignment is currently straight through most of this segment. To help eliminate passenger-freight conflicts, the CCJPA would help rebuild the Sacramento Northern line from Pittsburg to Sacramento and help construct a new high-level bridge between Mallard and Chip islands, near where Suisun Bay divides into the Sacramento and San Joaquin rivers. North of the bridge, the line would follow existing right-of-way for 17.5 miles before joining an abandoned right-of-way for 15.5 miles, finally rejoining the UPRR alignment east of Davis for the final few miles into Sacramento. As sub-alternatives, the line could branch off just south of Davis to join the original Sacramento North line into West Sacramento, or a new 12-

mile connection could be built to connect with the UPRR Sacramento Subdivision, just south of the city.

Figure 4-4 shows the proposed changes in this alignment.

Figure 4-4 Reconstructed Freight Right-of-Way in Suisun/Fairfield-Sacramento Segment



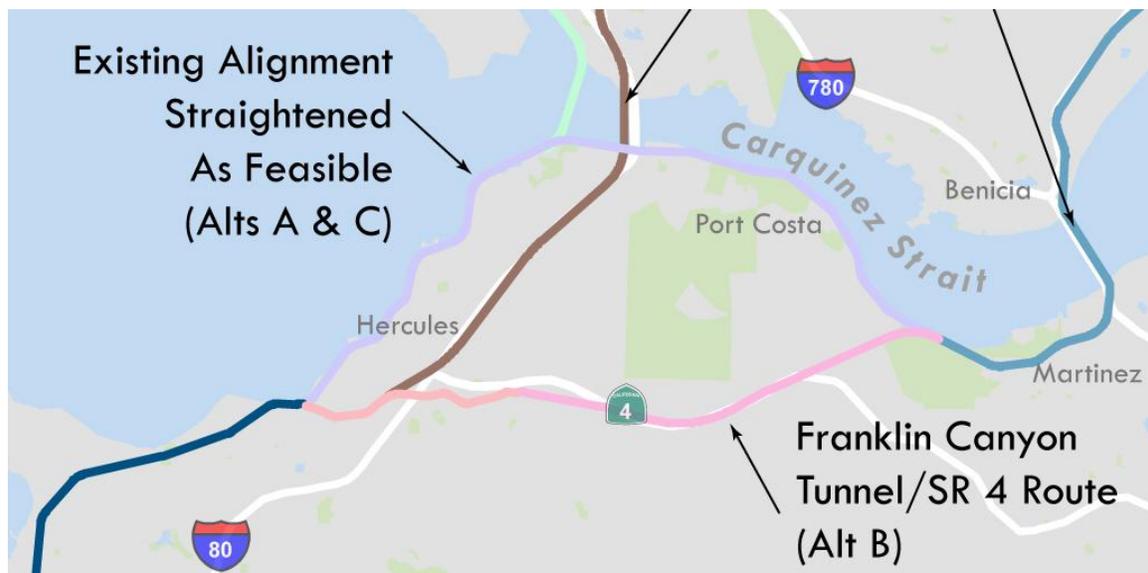
TRAVEL TIME BY ALIGNMENT ALTERNATIVES

For purposes of travel time savings analysis, the capital concepts described in the previous section were grouped into packages, or formal alternatives. These alternatives were developed so that schedules could be designed and later tested for their impacts on ridership. Ultimately, it is crucial to know, early in the long-term vision plan process, if certain alignment options yield significantly more ridership than other options or if there is not a significant difference between alternative alignments. If the former, CCJPA would focus on a particular alignment outcome and pursue it over other alignments even if it has slightly higher costs. Conversely, if the alignments yielded somewhat similar ridership results, other factors such as cost, environmental impact, and political feasibility would be the driving force for selecting the alignment.

There are two primary areas of alignment options along the route whereas otherwise the alignment is common between alternatives. The common alignment sections are, using a north to south perspective, the portions from Auburn to Martinez and Richmond to Oakland, and San Jose to Salinas. The locations where clear options are available to a long-term route are between Martinez and Richmond and Oakland to San Jose.

Between Martinez and Richmond, the options to straighten the existing many curves between using an engineered series of “cut-and-fill” modifications to establish a solution where higher speeds can be achieved using the existing alignment is directly contrasted against the option to generally follow the BNSF Franklin Canyon route, albeit with two sections of tunnels to avoid steep grades and to ensure re-connecting with the existing route in the Martinez area. Either routing option has its costs and environmental and political challenges, and in the initial analysis, either option appears to be similar in order-of-magnitude costs. For the purposes of this exercise, Alignment A and C utilized the cut/fill solution and Alignment B utilized the Franklin Canyon/tunnel option. These alignment options are shown in Figure 4-5 below.

Figure 4-5 Martinez-Richmond Alignment Options



The other area of alignment options between Oakland and San Jose includes various existing rail corridor alignments. There are essentially three options. The first, similar to the existing route used by the Capitol Corridor, is partially along the Oakland, Niles and Coast Subdivisions, using the Niles Cutoff in the Fremont/Centerville/Newark area between the subdivisions. This alternative, however, would bypass the existing Hayward Station and use a new tunneled connection to more directly access the Niles Cutoff. The other two options involve alignments that are more direct. One of these primarily uses the Coast Subdivision. This is the route used today by the Amtrak Long Distance Coast Starlight train, following a coastal alignment, although largely in the urbanized portion of the East Bay. In contrast to the prior two alignment options which each have passenger rail use, the last alignment option remains closer to the East Bay Hills and follows the Niles Subdivision used by Capitol Corridor today, but continuing south of the Fremont area along the Warm Springs subdivision, an alignment which is not used by passenger rail today (but will be used, on new, separate tracks, by the BART extension to San Jose). Alignment Alternative A follows the more coastal option, Alignment B uses the East Bay hills option, and Alignment C uses the route similar to the existing alignment. Each of the alignment options are shown in Figure 4-6 on the following page.

Figure 4-6 Oakland-San Jose Alignment Options



Alignment alternatives and “baseline” estimated travel times between Sacramento and San Jose (before adjustments made during the conceptual schedule development process described below) are shown in Table 4-1.

Table 4-1 Alternative Alignments and Baseline Travel Times

	Existing	A	B	C
Richmond-Fairfield		Improved Existing	Franklin Canyon Tunnels	Improved Existing
San Jose-Oakland		Coast	Niles-Warm Springs	Oakland/Niles/Coast
Travel Time	3:06	1:54	1:46	2:01

For each alternative, a hypothetical schedule was developed based on adjusted travel times. These adjustments were made in order to include station stops that were not included in the initial estimates (West Oakland Intermodal and Suisun for all alternatives, and Fremont/Newark for Alternative A) or to bypass stations, for limited-stop service (described in the following paragraphs). The amount of time added or subtracted was two to three minutes per stop, a high-level estimate based on estimated dwell and acceleration/deceleration times (dwell was assumed to remain relatively constant, while acceleration and deceleration would vary depending on operating speed in the segment). Based on these adjustments, the local-stop and limited-stop travel times shown in Table 4-2 were used to develop schedules. The conceptual schedules themselves can be found in Appendix A.

Table 4-2 Adjusted Travel Times

	Existing	A	B	C
Local-Stop (all-stop)				
Sacramento-West Oakland	1:53*	1:15	1:11	1:14
West Oakland-San Jose	1:15	0:47	0:39	0:52
Total	3:08	2:02	1:50	2:06
Limited-Stop (express)				
Sacramento-West Oakland	--	1:03	0:59	1:02
West Oakland-San Jose	--	0:39	0:33	0:44
Total	--	1:42	1:32	1:46

* Because there is no existing West Oakland station, existing travel times shown are between Sacramento and Oakland Jack London and between Oakland Jack London and San Jose.

Because the travel times used to develop schedules were longer than the “baseline” estimates, they should be viewed as relatively conservative: for example, travel times via the Alternative A alignment would be faster if the “Fremont\Newark” station (in the vicinity of the Ardenwood Park and Ride) were not included. Because the methodology used to add or subtract travel time was not as refined as that used to develop the baseline estimates, the scheduled times should also be understood to be somewhat high-level.

In addition to travel times, the conceptual schedules were developed based on 2013 Vision Plan Update principles including: more frequent service; a mix of service types including limited-stop or express service as well as all-stop local service; clockface-based headways; and clockface arrival and departure times at major hubs. Using the estimated travel times, the latter was not always possible. However, it was possible to develop schedules that had southbound limited-stop trains “overtaking” local trains at a conceptually new intermodal station with BART in West Oakland (at either the existing West Oakland BART station or a new intermodal station nearby), thereby allowing passengers to easily transfer not only to and from BART but between limited-stop and local trains at that location. It should be noted that BART has not adopted any such revamped or added new West Oakland station at this time nor has expressed any official plans to locate, serve, or acquire any real estate necessary for such a change. The inclusion of a new intermodal station in the West Oakland area is a placeholder for this Vision Plan that would conceptually address the situation of adding future Capitol Corridor customers to the BART system in the general area. Even today, if Capitol Corridor trains had a stop at the existing West Oakland station, during peak hour the BART trains are already extremely crowded and additional Capitol Corridor transfers would only exacerbate an existing capacity situation with BART. The CCJPA will continue to work with BART staff to coordinate future responses to intermodal transfers but for the purposes of this planning process there is an assumption that a new intermodal station with BART would be a key part of long-term intermodalism for the Bay Area.

Limited-stop or express trains would also serve Sacramento, Davis, Richmond, Oakland Jack London Square, Santa Clara Great America (if included in that alternative), San Jose Diridon, and if they operated to Salinas, Gilroy, Pajaro/Watsonville and Castroville. Existing travel times were assumed between Auburn and Sacramento, and currently projected travel times were assumed between San Jose and Salinas. The schedule was based on half-hourly local and half-hourly express service during peak periods (resulting in average headways of 15 minutes at the busiest stations) and mid-day headways for local trains of one hour, resulting in a total of 90 trains per day, four of which would serve Auburn, 20 Roseville, and 28 Salinas. In order to allow for “apples-to-apples” ridership comparisons, the same basic schedule and service level was assumed for each alternative, with variations only as necessary based on travel time differences.

Importantly to each alternative was the assumed conceptual intermodal connection to BART in the vicinity of the existing West Oakland BART Station or via the existing Oakland Jack London Capital Corridor station, if BART were to add a Jack London station as part of its proposed second Transbay Tube project, now undergoing study as part of the agency’s BART Vision long-term plan. Regardless of location, the ability to make timed connections with BART service to and from San Francisco in a location much closer to the city than the existing Richmond and Oakland Coliseum transfer points is a key objective of the Vision Plan Update. Without that assumed type of conceptual intermodal connection, the viability of any long-term plan would be compromised.

5 INITIAL RIDERSHIP ANALYSIS

Ridership projections are critical to assessing the need for and viability of the service objectives laid out in the long-term vision plan. A consistent challenge with ridership projections is finding or building the proper ridership model tool for the task at hand. Developing and testing a ridership model from scratch is a costly endeavor and was not an option for this Vision Plan Update. For an initial examination of projected ridership, the best available tool given resource/timing constraints for this Vision Plan Update was the California-based Amtrak Ridership and Revenue model. This model is primarily used to assess the effect of incremental Intercity Passenger Rail service schedule changes and projections of modest service frequency changes. Typically the model is looking out, at most, over a ten-year planning horizon. Its accuracy is regularly calibrated against actual ridership counts and thus it is fine-tuned over time. Historically it has presented slightly conservative estimates of ridership but, in hindsight, it has proven remarkably accurate, just slightly below Capitol Corridor's ridership actuals.

Using the Amtrak Ridership and Revenue model for such long term projections taxed what this model was ideally suited for, yet even if resources and time were available, it is clear there is no one perfect modeling tool; each is created for different purposes and has unique strengths and limitations. In order to best use this available tool, CCJPA worked with Caltrans Division of Rail staff, Amtrak, and their ridership modeling consultants for this ridership analysis to best reflect, in the professional judgment of the experienced modeling teams, what should be done to best adjust the model for a ridership analysis for 2040.

A number of factors contribute to make results more speculative the further out a model is expected to produce values. The further out models predict, the less uncertainty there is for the underlying future demographics. Another factor is how much frequency increases and speed changes will affect ridership – the scenarios tested represented a substantial increase in frequency and a significant reduction in travel time. The future attractiveness of alternative modes available, i.e., highway congestion, is also another speculative factor. In addition, these model runs each were adjusted, to account for a conceptually new Bay Area Rapid Transit District (BART) station located in the vicinity of BART's existing West Oakland Station – also conceptually associated with a new Transbay Tube. The modeling team had to account for this hypothetical key, timed, intermodal transit transfer with rapid connections to and from San Francisco.

The three alternatives discussed above present slight variations in travel time speeds and station stops, which represented differing levels in capital investment to achieve those travel time speeds. In this way, the CCJPA could not only assess the magnitude of the model's result, but also have some insight into what package of capital investments were most cost-effective according to the model. The schedules tested are included in Appendix A. As mentioned before, based on the ridership results and comparison between alternatives, we learn if particular alternatives are vital in driving ridership projections or if factors other than ridership should drive the selection of a future alignment alternative.

Future Demographics

Future population growth, land-use changes, and changes in demographics, jobs, housing, were accounted for in the ridership projection model using data generated by Moody's Analytics. Amtrak tailors the model for California, but the ridership and revenue model is a national model, thus making Moody's Analytics a nationally trusted source. Moody's Analytics' approach to forecasting the U.S. and its regional economies is informed by both national and regional analysis.

As described on the Moody's Analytics website:

“The process starts each month with the U.S. forecast. The Moody's Analytics U.S. macro model is a large, 1,600-equation simultaneous-equilibrium model that allows for interrelationships among all of the sectors of the U.S. economy, including production, income, financial markets, consumer spending, and labor markets. After the U.S. forecast is finalized, those results are used in the regional forecasts. The national drivers are run through models for each state and metro area. In addition to the national forecasts, regional variables such as costs of doing business are included in the regression equations whenever possible. Demographics and industrial structure also play key roles in defining the regional outlooks within the context of the U.S. macro forecast. Once the model-based forecast is derived, analysts review each state and metro area forecast to make sure the results are consistent with both the national forecast and regional-specific conditions.”

For the use with the ridership model, the modelers used Moody's county-level forecasts for population, employment, and total income. These forecasts are appended to census divisions (CD) based on the ratio of CD demographics to County demographics, and the CD-level forecasts are used in the station catchment-area and future year growth analysis.

While this approach is the standard used by Amtrak, regional planning forecasts such as those included with regional transportation plans (RTPs) developed by the Metropolitan Planning Organizations (MPOs) in the Capitol Corridor service area (e.g. Metropolitan Transportation Commission (MTC) and the Sacramento Area Council of Governments (SACOG)), may show more expansive growth or other demographic predictions than what Moody's may show.

Use of MPO growth predictions is also not without some concern. It should be noted that the objectives expressed in the RTPs are not guaranteed to be met by 2040. For instance, in the MTC's Plan Bay Area objectives, one objective is to house 100 percent of the region's projected population growth by income level (very-low, low, moderate, above-moderate) without displacing current low-income residents. The plan indicates that it will meet this target, yet, there is ample evidence that turning around a known housing affordability issue that has plagued the Bay Area for years will be a tall order. The point of bringing attention to demographic forecasts, whether the input comes from Moody's Analytics or it reflects meeting the objectives of each MPOs RTP, is that the use of future demographic and travel projections using models, especially for results over a quarter of a century away, is that such results may vary, so it would be ideal to use a variety of inputs and models to develop a bracketed range of future projections. To reiterate, this Vision Plan Update did not have the resources or timing to consider such an approach for the initial forecasts. One key action item from adoption of this Vision Plan Update is that CCJPA work with the Caltrans Rail Division, who oversees the use of the California Ridership and Revenue Model, to refine and test additional demographic inputs to the model to allow for a more bracketed analysis, or that there may be another appropriate ridership modeling tool, such as the California

High Speed Rail model which could be used with any follow-on actions from this Vision Plan Update.

Future Transit Connections

As with assessing future demographics, another test for the ridership model are the effects of future transit connections that are planned to enhance the transfer between modes from what they are today. A large assumption of the ridership model was that a faster and timed connection via a conceptually new BART intermodal station (built adjunct with a new Capitol Corridor station) could be added in the West Oakland as part of a conceptually new Transbay Tube with conceptually new San Francisco BART station connections. Nothing such as this is officially adopted by BART at this time but for the exercise of maximizing the long-term capital investment in Capitol Corridor as well as presuming some capacity enhancement will be needed for the BART system over this time frame, this Vision Plan Update process assumes that “something” related to added BART Transbay Tube capacity and West Oakland will happen in the long-term timeframe. As well, for the purposes of intercity travel and intermodality, Capitol Corridor’s long-term service would be significantly enhanced by upgraded BART service/capacity enhancement in the West Oakland area. BART long-term plans are also a chance to enhance the long-term transit connectivity over the BART connections that exist today at Richmond and Oakland Coliseum.

The method of analyzing that vastly improved transit connectivity was done by examining travel time paths (including a timed transfer penalty) to various destinations from the BART system in addition to a connection with the Capitol Corridor. The method used was akin to how the California Ridership and Revenue Model is used with planning bus routes connecting to Capitol Corridor service today. Using a new connection and examining today’s existing origin-destination pairing using joint Capitol Corridor/BART stations, such as Richmond, the modeling team was able to divide existing BART usage from Capitol Corridor into quadrants. In short, if existing data showed transfers at Richmond would travel on the BART system to/from the Richmond line from MacArthur BART station north as well as stations along Pittsburg/Bay Point, those patrons would continue to use the Richmond station as a transfer point. However, for all transfers to BART stations in San Francisco, and even those trips to the Fremont and Dublin/Pleasanton stations, the new West Oakland intermodal station becomes the optimum Capitol Corridor transfer point. The model captured this documented behavior and used developed travel times to incorporate the projected future ridership and transfers using a conceptually new West Oakland Capitol Corridor/BART intermodal station.

Accounting for Future Highway Congestion

There are two versions of the California Ridership and Revenue Model. The model used is responsive to does account for time-of-day and frequency. This model, however, does not take into account long-term mode-shift due to traffic congestion increases. As of this writing, Caltrans Rail Division staff are working with other staff at Caltrans who monitor future highway performance and the anticipation is that a qualitative discussion of the effect of highway congestion for 2040 as compared to conditions today will be included. For any recommended future ridership modeling, future highway congestion is a recommended component to be included in the model. This would lead to a modeling approach such as used with the California High Speed Rail model to further refine the long-term planning inclusive of future highway congestion. Because the future effects of highway congestion were not included in the ridership projections shown in Table 5-1 in the following pages, we have every reason to believe the

ridership projections are inherently low and can be considered conservative ridership projections. We already know that each of the 2040 alternatives have travel times far superior to even the best possible travel times available today in the best conditions, as shown in Table 4-2 in the previous chapter.

Table 5-3 Adjusted Travel Times

	A	B	C	Existing
Local-Stop (all-stop)				
Sacramento-West Oakland	1:15	1:11	1:14	1:53*
West Oakland-San Jose	0:47	0:39	0:52	1:15
Total	2:02	1:50	2:06	3:08
Limited-Stop (express)				
Sacramento-West Oakland	1:03	0:59	1:02	--
West Oakland-San Jose	0:39	0:33	0:44	--
Total	1:42	1:32	1:46	--

* Because there is no existing West Oakland station, times shown are between Sacramento and Oakland Jack London and between Oakland Jack London and San Jose.

RIDERSHIP MODELING RESULTS

Table 5-1 on the following page summarizes the ridership results from the modeling effort. To show the effects of background growth between 2015 and 2040 and the effect of the various alternative schedules, the table is broken into several distinct columns. For ease of discussion, the results of the various alternatives are averaged to establish general conclusions regarding ridership. The first column of results is the base 2015 annual ridership. The next column is the 2015 results if the long-term vision plan for each alternative were implemented overnight and annual ridership tallied from that point. The next column is what annual ridership would be for 2040 if none of the long-term vision plan, and none of the short or medium-term projects were implemented and the 2015 service plan were never changed for 25 years. As compared to the 2015 annual ridership, this demonstrates there is a natural background growth of 62% as predicted using the Moody’s Analytics demographic and economic forecasts. Finally, in the last column, are the 2040 annual ridership values if the various long-term alternatives were implemented. As compared to the 2015 service, annual ridership increases on the order of 336% - some of that being background growth, but the bulk of it being the more frequent, faster service with the timed connection with the conceptually new BART West Oakland intermodal station.

Table 5-1 Ridership Estimates

Alternative	2015 Service	2015 “Instant” Vision	2015 Service with 2040 Growth	2040 Vision with Growth
Baseline	1,402,300		2,267,200	
Alternative A		3,778,200		6,108,600
Alternative B		3,825,700		6,190,700
Alternative C		3,732,700		6,038,400
Avg of Alts		3,778,867		6,112,567
Ridership Gain	<i>From “Instant” Vision</i>	2,376,567	<i>From 2015</i>	4,710,267

The relative similarities between the figures for each alternative indicate that while alignments – specifically travel times and station locations – would have some impact on ridership, all else being equal, the differences in ridership between the alternatives are not so great that ridership impacts of alignment choices should be a primary driver of the decision-making process. Put another way, future decisions on major capital investments should be made on the basis of cost-benefit analysis taking into account a range of factors in addition to ridership, including political feasibility, constructability and other inputs.

The CCJPA’s Ad Hoc Vision Plan Subcommittee reviewed these ridership results and collectively determined that even without accounting for future highway congestion and the other parameter testing options available, the ridership results were significant enough to warrant moving forward from this Vision Plan Update into a next step – a Vision Implementation Plan. This will be discussed in a subsequent section and will include a variety of additional in-depth analysis into the long-term vision prospects.

OTHER RIDERSHIP AND MARKET ANALYSIS TOOLS

Selecting the Amtrak Ridership and Revenue Model as the model analysis tool for this Vision Plan Update was clearly the best available tool to use given the resources and timing for the Update. However, there are other tools which warrant exploration as directed by the CCJPA’s Ad Hoc Vision Plan Subcommittee especially if the full CCJPA Board directs CCJPA staff to begin work on a Vision Implementation Plan. These additional options are discussed as a preface to the Vision Implementation Plan section. In general, the approach with ridership estimates and/or market analysis would be to bracket the future projections so that future policy makers have some sense of the consistent magnitude of future ridership as well as the factors which can drive ridership or consideration of capital investment and environmental analysis..

Emerging California Market Analysis Tool

At this time, the California State Transportation Agency is working with the California High Speed Rail Authority to blend several travel market analysis tools into one meshed market analysis tool which has potential to fine tune the service schedule but also help support the market potential of the Capitol Corridor long-term vision service plan. Unlike a ridership model, this tool is not a forecasting model but rather a market analysis tool in which, future growth assumptions could be loaded and then various ‘what-if’ travel time speeds were tested for various

modes, including IPR service. This tool is in development at this time but it includes, as its basis, the use of actual train origin-destination data, the California Travel Demand Model administered by Caltrans, and the FRA's inclusive travel model which includes air travel. By blending these data sources using several reasoned conversion and assumption tools, a variety of market mode shares can be determined for longer intercity trips which travel between travel districts created by the analysis team. The travel districts are group travel analysis zones that exhibit similar grouped travel behavior when it comes to intercity travel – they are distinctly similar in their travel patterns enough so that travel between districts can be assessed. Travel path options can also be assessed using travel time as well. Through this analysis, it is feasible to gain insight into the existing market share that Capitol Corridor may capture of the district to district trips, for instance, Sacramento to Oakland. More about this tool needs to be tested, but it does hold promise to be a useful analysis tool for examining future travel time performance in a given corridor. Combining it with a refined ridership and revenue model administered by the state (Caltrans Rail Division or CalSTA) would yield an ideal set of tools to complete a more in-depth market and ridership analysis of the long-term vision service plan.

California High Speed Rail Model

The California High Speed Rail Model was expressly developed to model and predict future ridership results for the California High Speed Rail (HSR) service already under construction. It is oriented toward that objective and treats intercity and commuter passenger rail as one of the modes of input to the high speed rail service. Thus, it will not be able to provide stand-alone estimates for the Capitol Corridor service in 2040. The HSR model does include peak and off-peak model analysis but again, is not ideal for modes such as the Capitol Corridor service. CCJPA staff need to have the opportunity to interact with the HSR model staff to explore what, if any, modifications could be made to the model to assist CCJPA with any additional Vision Implementation Plan refinements and analysis to ridership values over and above any refinements possible to the already utilized Amtrak Ridership and Revenue model.

6 NEXT STEPS

The CCJPA's Ad Hoc Vision Plan Update Subcommittee has recommended that the CCJPA Board adopt this Vision Plan Update in November 2014. A follow-up phase of the Vision Plan process, the Vision Implementation Plan, could then proceed. The Vision Implementation Plan, or VIP, has been conceived as a more in-depth analysis of future operations and the accompanying capital program. The VIP would be followed by a third phase of the Vision Plan process, the Vision Communications Plan or VCP. Once all three phases are completed, the CCJPA Board may direct CCJPA staff to proceed with funding and environmental documentation efforts, the latter of a programmatic or possibly even project nature.

Major elements of the VIP are described below.

VISION IMPLEMENTATION PLAN ELEMENTS

Integration with Partner Planning Efforts

An essential first step would be to ensure that the VIP is coordinated with related planning efforts, that partner agencies are made aware of the VIP, and that input is solicited from key stakeholders. This would include (but not be limited to):

- Discussions with staff from the metropolitan planning organizations (MPOs) in both the Bay Area and Sacramento region – the Metropolitan Transportation Commission, or MTC, and the Sacramento Area Council of Governments, or SACOG – about the VIP and about any joint planning efforts, official or otherwise, that may be underway between the two of them. Through these discussions, Capitol Corridor staff and consultants should convey to staff at both agencies that among the core objectives of the Vision Plan process are:
 - Provider support for the national and international economic competitiveness of the emerging Northern California “megaregion.”
 - Offer an alternative for increased mobility in the Interstate 80 corridor to expensive and environmentally damaging expansion of I-80 itself.

These discussions should also convey the message that while the Capitol Corridor is not the exclusive responsibility of either region, it is an asset shared by both regions and a key piece of infrastructure linking the two regions both physically and economically.

- Initial discussions with Union Pacific Railroad (UPRR) staff regarding Vision Plan concepts including a new freight rail corridor between Martinez and Sacramento and expansion of the shared freight and passenger right-of-way between Oakland and Richmond.
- Coordination with:
 - The Contra Costa Transportation Authority (CCTA) and West Contra Costa Transportation Advisory Committee (WCCTAC) regarding their planned I-80 corridor transit study.
 - The San Joaquin Regional Rail Commission (SJRRRC) and Altamont Commuter Express (ACE) regarding expansion of their service between the Central Valley and Silicon Valley.

- San Joaquin Joint Powers Authority (SJJPA) and Caltrans Division of Rail staff regarding their most current service and capital planning efforts.
- County-level Congestion Management Agencies (CMAs) such as the Alameda County Transportation Commission (ACTC) and Solano Transportation Authority (STA) regarding their long-term planning efforts.

Additional Ridership Forecasting

The preliminary ridership projections developed for this Update and described in this document are, as was previously stated, initial forecasts. The tool that was used, the Amtrak Ridership and Revenue model, has a proven track record of accuracy, but also known limitations. In short, it was designed to model the effects of relatively minor changes over the short term, and is typically not used to forecast the long-range, much greater changes to travel times, service levels and connectivity envisioned by this plan. It also relies on national rather than local and regional population and employment forecasts.

Additional modeling will be required, then, in order to:

- Better understand the ridership potential associated with a timed and seamless intermodal connection to BART as close as physically possible to San Francisco.
- Better understand the potential impacts of constraints on expansion of Interstate 80 given future growth in demand for travel between the Bay Area and Sacramento region.
- Better define and compare subregional travel markets and origin-destination pairs, in order to better inform decisions regarding alternative alignments, station locations and service patterns.
- Refine and define a range of ridership projections using different tools in order to provide greater certainty.

Potential tools and methodological approaches are described in the previous section. Just as occurred during this process, CCJPA staff and consultants will seek to work with partner agencies to leverage existing ridership forecasting tools, modifying them as necessary, rather than committing the significantly resources necessary to develop a new, custom modeling application.

Service Planning, Operating Cost Estimates, and ROI Analysis

In this first phase, the Vision Plan update, conceptual schedules were developed based on the conceptual service plan described in the final section of Chapter 4 (featuring 90 daily trains, limited-stop service, 15-minute peak headways, etc.). As a precursor to the core VIP outcome described in the following section, the phased capital strategy, this service plan should be refined and annual (future-year) operating costs should be estimated. This will allow for more refined cost-benefit analysis of potential returns on investment, including operating cost commitments. Costs may also be assessed at the segment level. Benefits to be included in the assessment of ROI might include ridership and revenue as well as non-transit performance measures such as reductions in regional vehicle miles traveled (VMT) and accompanying reductions in greenhouse gas (GHG) emissions as well as mobility improvements for disadvantaged communities. Cost estimates will take into account both service levels as well as unit costs associated with operation of 150 mph electrified service.

Phased Capital Strategy

Perhaps the most important outcome of the VIP would be a phased implementation strategy for capital investments based on cost-benefit analysis, analysis of constraints and opportunities in terms of timing and sequencing, and assessments of “throwaway” costs, or investments in alignment segments planned for eventual abandonment (as such investments might make sense, even if they are not permanent, if they can deliver substantial benefits in the interim at relatively low cost). This task would seek to identify early returns and ensure that the preferred alternative can be implemented as efficiently as possible. It would identify initial, early-stage projects that should be advanced into the planning “pipeline” and subjected to environmental analysis in the near term. It would include analysis of right-of-way projects as well as station modifications and other improvements, such as overhead contact system infrastructure.

VISION COMMUNICATIONS PLAN

Following completion of the VIP and prior to environmental analysis, a third and final phase of the Vision Plan process will need to be carried out. The Vision Communication Plan or VCP will be a process of formal engagement with CCJPA partners, other agency stakeholders, elected officials and community members in affected communities regarding the project alternatives. This will build on the staff outreach element of the VIP described in the previous section. It would also describe the function of the service in being an asset to business, mobility, and economic vitality.

This process will be critical, as some of the alternatives identified in this Plan Update and refined through the VIP could result in negative impacts as well as benefits, and could prove highly controversial. Additionally, some concepts would be very expensive, and could not be funded without strong political support. CCJPA staff and Board members will need to work closely with their partners in the outreach process to ensure that those partners’ concerns are heard, understood and responded to.

The exact form this process will take has not yet been determined, but the hoped-for outcome is development of some consensus around a preferred alternative, at which point both environmental analysis and advocacy for the funding necessary to implement recommended near-term projects can occur.

2014 VISION PLAN UPDATE FINAL REPORT | CAPITOL CORRIDOR
 Capitol Corridor Joint Powers Authority

Table A-2 Schedule: Alternative A: Southbound/Westbound:PM

Southbound/Westbound																						
Auburn																						
Rocklin																						
Roseville								3:45P				4:45P				5:45P						
Sacramento AR								4:10P				5:10P				6:10P						
Sacramento DP				3:00P	3:30P	3:45P	4:00P	4:15P	4:30P	4:45P	5:00P	5:15P	5:30P	5:45P	6:00P	6:15P	6:30P	7:00P	8:00P	9:00P	10:00P	11:00P
Davis				3:08P	3:38P	3:53P	4:08P	4:23P	4:38P	4:53P	5:08P	5:23P	5:38P	5:53P	6:08P	6:23P	6:38P	7:08P	8:08P	9:08P	10:08P	11:08P
Fairfield/Vacaville				3:21P	3:51P		4:21P		4:51P		5:21P		5:51P		6:21P		6:51P	7:21P	8:21P	9:21P	10:21P	11:21P
Suisun				3:25P	3:55P		4:25P		4:55P		5:25P		5:55P		6:25P		6:55P	7:25P	8:25P	9:25P	10:25P	11:25P
Martinez				3:40P	4:10P	4:19P	4:40P	4:49P	5:10P	5:19P	5:40P	5:49P	6:10P	6:19P	6:40P	6:49P	7:10P	7:40P	8:40P	9:40P	10:40P	11:40P
Richmond				4:00P	4:30P	4:39P	5:00P	5:09P	5:30P	5:39P	6:00P	6:09P	6:30P	6:39P	7:00P	7:09P	7:30P	8:00P	9:00P	10:00P	11:00P	12:00A
Berkeley				4:06P	4:36P		5:06P		5:36P		6:06P		6:36P		7:06P		7:36P	8:06P	9:06P	10:06P	11:06P	12:06A
Emeryville				4:10P	4:40P		5:10P		5:40P		6:10P		6:40P		7:10P		7:40P	8:10P	9:10P	10:10P	11:10P	12:10A
West Oakland AR				4:15P	4:45P	4:48P	5:15P	5:18P	5:45P	5:48P	6:15P	6:18P	6:45P	6:48P	7:15P	7:18P	7:45P	8:15P	9:15P	10:15P	11:15P	12:15A
West Oakland DP	3:48P	3:50P	4:18P	4:20P	4:50P	4:48P	5:20P	5:18P	5:50P	5:48P	6:20P	6:18P	6:50P		7:20P		7:50P	8:20P	9:20P	10:20P	11:20P	
Oakland Jack London	3:53P	3:55P	4:23P	4:25P	4:55P	4:53P	5:25P	5:23P	5:55P	5:53P	6:25P	6:23P	6:55P		7:25P		7:55P	8:25P	9:25P	10:25P	11:25P	
Oakland Coliseum		4:03P		4:33P	5:03P		5:33P		6:03P		6:33P		7:03P		7:33P		8:03P	8:33P	9:33P	10:33P	11:33P	
Fremont/Newark		4:16P		4:46P	5:16P		5:46P		6:16P		6:46P		7:16P		7:46P		8:16P	8:46P	9:46P	10:46P	11:46P	
Santa Clara Great America	4:18P	4:26P	4:48P	4:56P	5:26P	5:18P	5:56P	5:48P	6:26P	6:18P	6:56P	6:48P	7:26P		7:56P		8:26P	8:56P	9:56P	10:56P	11:56P	
Santa Clara University		4:34P		5:04P	5:34P		6:04P		6:34P		7:04P		7:34P		8:04P		8:34P	9:04P	10:04P	11:04P	12:04A	
San Jose Diridon AR	4:27P	4:37P	4:57P	5:07P	5:37P	5:27P	6:07P	5:57P	6:37P	6:27P	7:07P	6:57P	7:37P		8:07P		8:37P	9:07P	10:07P	11:07P	12:07A	
San Jose Diridon DP			5:00P	5:10P			6:10P	6:00P			7:10P				8:10P							
Tamien				5:15P			6:15P				7:15P				8:15P							
Morgan Hill				5:33P			6:33P				7:33P				8:33P							
Gilroy			5:31P	5:47P			6:47P	6:31P			7:47P				8:47P							
Pajaro/Watsonville			6:00P	6:16P			7:16P	7:00P			8:16P				9:16P							
Castroville			6:15P	6:31P			7:31P	7:15P			8:31P				9:31P							
Salinas			6:25P	6:41P			7:41P	7:25P			8:41P				9:41P							

2014 VISION PLAN UPDATE FINAL REPORT | CAPITOL CORRIDOR
 Capitol Corridor Joint Powers Authority

Table A-3 Schedule: Alternative A: Northbound/Eastbound:AM/Mid-Day

Northbound/Eastbound																								
Salinas										5:00A		5:40A		6:00A		6:40A		7:05A	7:35A	8:35A		10:35A		12:35P
Castroville										5:10A		5:50A		6:10A		6:50A		7:15A	7:45A	8:45A		10:45A		12:45P
Pajaro/Watsonville										5:25A		6:05A		6:25A		7:05A		7:30A	8:00A	9:00A		11:00A		1:00P
Gilroy										5:54A		6:34A		6:54A		7:34A		7:59A	8:29A	9:29A		11:29A		1:29P
Morgan Hill										6:08A				7:08A				8:13A	8:43A	9:43A		11:43A		1:43P
Tamien										6:26A				7:26A				8:31A	9:01A	10:01A		12:01P		2:01P
San Jose Diridon AR										6:31A		7:05A		7:31A		8:05A		8:36A	9:06A	10:06A		12:06P		2:06P
San Jose Diridon DP				5:10A	5:35A	5:40A	6:05A	6:10A	6:35A	6:40A	7:05A	7:10A	7:35A	7:40A	8:05A	8:10A	8:40A	9:10A	10:10A	11:10A	12:10P	1:10P	2:10P	
Santa Clara University				5:13A		5:43A		6:13A		6:43A		7:13A		7:43A		8:13A	8:43A	9:13A	10:13A	11:13A	12:13P	1:13P	2:13P	
Santa Clara Great America				5:21A	5:44A	5:51A	6:14A	6:21A	6:44A	6:51A	7:14A	7:21A	7:44A	7:51A	8:14A	8:21A	8:51A	9:21A	10:21A	11:21A	12:21P	1:21P	2:21P	
Fremont/Newark				5:31A		6:01A		6:31A		7:01A		7:31A		8:01A		8:31A	9:01A	9:31A	10:31A	11:31A	12:31P	1:31P	2:31P	
Oakland Coliseum				5:44A		6:14A		6:44A		7:14A		7:44A		8:14A		8:44A	9:14A	9:44A	10:44A	11:44A	12:44P	1:44P	2:44P	
Oakland Jack London				5:52A	6:09A	6:22A	6:39A	6:52A	7:09A	7:22A	7:39A	7:52A	8:09A	8:22A	8:39A	8:52A	9:22A	9:52A	10:52A	11:52A	12:52P	1:52P	2:52P	
West Oakland AR				5:57A	6:14A	6:27A	6:44A	6:57A	7:14A	7:27A	7:44A	7:57A	8:14A	8:27A	8:44A	8:57A	9:27A	9:57A	10:57A	11:57A	12:57P	1:57P	2:57P	
West Oakland DP	5:00A	5:30A	5:45A	6:00A	6:15A	6:30A	6:45A	7:00A	7:15A	7:30A	7:45A	8:00A		8:30A		9:00A		10:00A	11:00A	12:00P	1:00P	2:00P	3:00P	
Emeryville	5:05A	5:35A		6:05A		6:35A		7:05A		7:35A		8:05A		8:35A		9:05A		10:05A	11:05A	12:05P	1:05P	2:05P	3:05P	
Berkeley	5:09A	5:39A		6:09A		6:39A		7:09A		7:39A		8:09A		8:39A		9:09A		10:09A	11:09A	12:09P	1:09P	2:09P	3:09P	
Richmond	5:15A	5:45A	5:54A	6:15A	6:24A	6:45A	6:54A	7:15A	7:24A	7:45A	7:54A	8:15A		8:45A		9:15A		10:15A	11:15A	12:15P	1:15P	2:15P	3:15P	
Martinez	5:35A	6:05A	6:14A	6:35A	6:44A	7:05A	7:14A	7:35A	7:44A	8:05A	8:14A	8:35A		9:05A		9:35A		10:35A	11:35A	12:35P	1:35P	2:35P	3:35P	
Suisun	5:50A	6:20A		6:50A		7:20A		7:50A		8:20A		8:50A		9:20A		9:50A		10:50A	11:50A	12:50P	1:50P	2:50P	3:50P	
Fairfield/Vacaville	5:54A	6:24A		6:54A		7:24A		7:54A		8:24A		8:54A		9:24A		9:54A		10:54A	11:54A	12:54P	1:54P	2:54P	3:54P	
Davis	6:07A	6:37A	6:40A	7:07A	7:10A	7:37A	7:40A	8:07A	8:10A	8:37A	8:40A	9:07A		9:37A		10:07A		11:07A	12:07P	1:07P	2:07P	3:07P	4:07P	
Sacramento AR	6:15A	6:45A	6:48A	7:15A	7:18A	7:45A	7:48A	8:15A	8:18A	8:45A	8:48A	9:15A		9:45A		10:15A		11:15A	12:15P	1:15P	2:15P	3:15P	4:15P	
Sacramento DP			6:50A				7:50A				8:50A					10:15A			12:15P		2:15P		4:15P	
Roseville			7:15A				8:15A				9:15A					10:40A			12:40P		2:40P		4:40P	
Rocklin																								
Auburn																								

2014 VISION PLAN UPDATE FINAL REPORT | CAPITOL CORRIDOR
 Capitol Corridor Joint Powers Authority

Table A-4 Schedule: Alternative A: Northbound/Eastbound:PM

Northbound/Eastbound																									
Salinas						2:30P										4:30P				5:35P	6:35P	7:35P			
Castroville						2:40P										4:40P				5:45P	6:45P	7:45P			
Pajaro/Watsonville						2:55P										4:55P				6:00P	7:00P	8:00P			
Gilroy						3:24P										5:24P				6:29P	7:29P	8:29P			
Morgan Hill						3:38P										5:38P				6:43P	7:43P	8:43P			
Tamien						3:56P										5:56P				7:01P	8:01P	9:01P			
San Jose Diridon AR						4:01P										6:01P				7:06P	8:06P	9:06P			
San Jose Diridon DP			3:10P		3:40P	4:05P	4:10P	4:35P	4:40P	5:05P	5:10P	5:35P	5:40P	6:05P	6:10P	6:35P	6:40P	7:10P	8:10P	9:10P	10:10P	11:10P			
Santa Clara University			3:13P		3:43P		4:13P		4:43P		5:13P		5:43P		6:13P		6:43P	7:13P	8:13P	9:13P	10:13P	11:13P			
Santa Clara Great America			3:21P		3:51P	4:14P	4:21P	4:44P	4:51P	5:14P	5:21P	5:44P	5:51P	6:14P	6:21P	6:44P	6:51P	7:21P	8:21P	9:21P	10:21P	11:21P			
Fremont/Newark			3:31P		4:01P		4:31P		5:01P		5:31P		6:01P		6:31P		7:01P	7:31P	8:31P	9:31P	10:31P	11:31P			
Oakland Coliseum			3:44P		4:14P		4:44P		5:14P		5:44P		6:14P		6:44P		7:14P	7:44P	8:44P	9:44P	10:44P	11:44P			
Oakland Jack London			3:52P		4:22P	4:39P	4:52P	5:09P	5:22P	5:39P	5:52P	6:09P	6:22P	6:39P	6:52P	7:09P	7:22P	7:52P	8:52P	9:52P	10:52P	11:52P			
West Oakland AR			3:57P		4:27P	4:44P	4:57P	5:14P	5:27P	5:44P	5:57P	6:14P	6:27P	6:44P	6:57P	7:14P	7:27P	7:57P	8:57P	9:57P	10:57P	11:57P			
West Oakland DP	3:30P	3:45P	4:00P	4:15P	4:30P	4:45P	5:00P	5:15P	5:30P	5:45P	6:00P	6:15P	6:30P		7:00P		7:30P	8:00P	9:00P	10:00P	11:00P				
Emeryville	3:35P		4:05P		4:35P		5:05P		5:35P		6:05P		6:35P		7:05P		7:35P	8:05P	9:05P	10:05P	11:05P				
Berkeley	3:39P		4:09P		4:39P		5:09P		5:39P		6:09P		6:39P		7:09P		7:39P	8:09P	9:09P	10:09P	11:09P				
Richmond	3:45P	3:54P	4:15P	4:24P	4:45P	4:54P	5:15P	5:24P	5:45P	5:54P	6:15P	6:24P	6:45P		7:15P		7:45P	8:15P	9:15P	10:15P	11:15P				
Martinez	4:05P	4:14P	4:35P	4:44P	5:05P	5:14P	5:35P	5:44P	6:05P	6:14P	6:35P	6:44P	7:05P		7:35P		8:05P	8:35P	9:35P	10:35P	11:35P				
Suisun	4:20P		4:50P		5:20P		5:50P		6:20P		6:50P		7:20P		7:50P		8:20P	8:50P	9:50P	10:50P	11:50P				
Fairfield/Vacaville	4:24P		4:54P		5:24P		5:54P		6:24P		6:54P		7:24P		7:54P		8:24P	8:54P	9:54P	10:54P	11:54P				
Davis	4:37P	4:40P	5:07P	5:10P	5:37P	5:40P	6:07P	6:10P	6:37P	6:40P	7:07P	7:10P	7:37P		8:07P		8:37P	9:07P	10:07P	11:07P	12:07A				
Sacramento AR	4:45P	4:48P	5:15P	5:18P	5:45P	5:48P	6:15P	6:18P	6:45P	6:48P	7:15P	7:18P	7:45P		8:15P		8:45P	9:15P	10:15P	11:15P	12:15A				
Sacramento DP				5:20P		5:50P		6:20P																	
Roseville				5:45P		6:15P		6:45P																	
Rocklin				5:54P				6:54P																	
Auburn				6:12P				7:12P																	

2014 VISION PLAN UPDATE FINAL REPORT | CAPITOL CORRIDOR
 Capitol Corridor Joint Powers Authority

Table A-5 Schedule: Alternative B: Southbound/Westbound:AM/Mid-Day

Southbound/Westbound																								
Auburn															6:18A									7:18A
Rocklin															6:36A									7:36A
Roseville										6:15A		6:45A		7:15A		7:45A			9:30A		11:30A		1:30P	
Sacramento AR										6:40A		7:10A		7:40A		8:10A			9:55A		11:55A		1:55P	
Sacramento DP				5:00A	5:30A	5:45A	6:00A	6:15A	6:30A	6:45A	7:00A	7:15A	7:30A	7:45A	8:00A	8:15A	8:30A	9:00A	10:00A	11:00A	12:00P	1:00P	2:00P	
Davis				5:08A	5:38A	5:53A	6:08A	6:23A	6:38A	6:53A	7:08A	7:23A	7:38A	7:53A	8:08A	8:23A	8:38A	9:08A	10:08A	11:08A	12:08P	1:08P	2:08P	
Fairfield/Vacaville				5:21A	5:51A		6:21A		6:51A		7:21A		7:51A		8:21A		8:51A	9:21A	10:21A	11:21A	12:21P	1:21P	2:21P	
Suisun				5:25A	5:55A		6:25A		6:55A		7:25A		7:55A		8:25A		8:55A	9:25A	10:25A	11:25A	12:25P	1:25P	2:25P	
Martinez				5:40A	6:10A	6:19A	6:40A	6:49A	7:10A	7:19A	7:40A	7:49A	8:10A	8:19A	8:40A	8:49A	9:10A	9:40A	10:40A	11:40A	12:40P	1:40P	2:40P	
Richmond				5:56A	6:26A	6:35A	6:56A	7:05A	7:26A	7:35A	7:56A	8:05A	8:26A	8:35A	8:56A	9:05A	9:26A	9:56A	10:56A	11:56A	12:56P	1:56P	2:56P	
Berkeley				6:02A	6:32A		7:02A		7:32A		8:02A		8:32A		9:02A		9:32A	10:02A	11:02A	12:02P	1:02P	2:02P	3:02P	
Emeryville				6:06A	6:36A		7:06A		7:36A		8:06A		8:36A		9:06A		9:36A	10:06A	11:06A	12:06P	1:06P	2:06P	3:06P	
West Oakland AR				6:11A	6:41A	6:44A	7:11A	7:14A	7:41A	7:44A	8:11A	8:14A	8:41A	8:44A	9:11A	9:14A	9:41A	10:11A	11:11A	12:11P	1:11P	2:11P	3:11P	
West Oakland DP	5:15A	5:45A	6:14A	6:15A	6:45A	6:44A	7:15A	7:14A	7:45A	7:44A	8:15A	8:14A	8:45A		9:15A			10:15A	11:15A	12:15P	1:15P	2:15P	3:15P	
Oakland Jack London	5:20A	5:50A	6:19A	6:20A	6:50A	6:49A	7:20A	7:19A	7:50A	7:49A	8:20A	8:19A	8:50A		9:20A			10:20A	11:20A	12:20P	1:20P	2:20P	3:20P	
Oakland Coliseum	5:28A	5:58A		6:28A	6:58A		7:28A		7:58A		8:28A		8:58A		9:28A			10:28A	11:28A	12:28P	1:28P	2:28P	3:28P	
Hayward	5:35A	6:05A		6:35A	7:05A		7:35A		8:05A		8:35A		9:05A		9:35A			10:35A	11:35A	12:35P	1:35P	2:35P	3:35P	
San Jose Diridon AR	5:54A	6:24A	6:47A	6:54A	7:24A	7:17A	7:54A	7:47A	8:24A	8:17A	8:54A	8:47A	9:24A		9:54A			10:54A	11:54A	12:54P	1:54P	2:54P	3:54P	
San Jose Diridon DP	5:55A			6:55A			7:55A				8:55A							10:55A		12:55P		2:55P	3:55P	
Tamien	6:00A			7:00A			8:00A				9:00A							11:00A		1:00P		3:00P	4:00P	
Morgan Hill	6:18A			7:18A			8:18A				9:18A							11:18A		1:18P		3:18P	4:18P	
Gilroy	6:32A			7:32A			8:32A				9:32A							11:32A		1:32P		3:32P	4:32P	
Pajaro/Watsonville	7:01A			8:01A			9:01A				10:01A							12:01P		2:01P		4:01P	5:01P	
Castroville	7:16A			8:16A			9:16A				10:16A							12:16P		2:16P		4:16P	5:16P	
Salinas	7:26A			8:26A			9:26A				10:26A							12:26P		2:26P		4:26P	5:26P	

Table A-6 Schedule: Alternative B: Southbound/Westbound:PM

Southbound/Westbound																						
Auburn																						
Rocklin																						
Roseville								3:45P				4:45P				5:45P						
Sacramento AR								4:10P				5:10P				6:10P						
Sacramento DP				3:00P	3:30P	3:45P	4:00P	4:15P	4:30P	4:45P	5:00P	5:15P	5:30P	5:45P	6:00P	6:15P	6:30P	7:00P	8:00P	9:00P	10:00P	11:00P
Davis				3:08P	3:38P	3:53P	4:08P	4:23P	4:38P	4:53P	5:08P	5:23P	5:38P	5:53P	6:08P	6:23P	6:38P	7:08P	8:08P	9:08P	10:08P	11:08P
Fairfield/Vacaville				3:21P	3:51P		4:21P		4:51P		5:21P		5:51P		6:21P		6:51P	7:21P	8:21P	9:21P	10:21P	11:21P
Suisun				3:25P	3:55P		4:25P		4:55P		5:25P		5:55P		6:25P		6:55P	7:25P	8:25P	9:25P	10:25P	11:25P
Martinez				3:40P	4:10P	4:19P	4:40P	4:49P	5:10P	5:19P	5:40P	5:49P	6:10P	6:19P	6:40P	6:49P	7:10P	7:40P	8:40P	9:40P	10:40P	11:40P
Richmond				3:56P	4:26P	4:35P	4:56P	5:05P	5:26P	5:35P	5:56P	6:05P	6:26P	6:35P	6:56P	7:05P	7:26P	7:56P	8:56P	9:56P	10:56P	11:56P
Berkeley				4:02P	4:32P		5:02P		5:32P		6:02P		6:32P		7:02P		7:32P	8:02P	9:02P	10:02P	11:02P	12:02A
Emeryville				4:06P	4:36P		5:06P		5:36P		6:06P		6:36P		7:06P		7:36P	8:06P	9:06P	10:06P	11:06P	12:06A
West Oakland AR				4:11P	4:41P	4:44P	5:11P	5:14P	5:41P	5:44P	6:11P	6:14P	6:41P	6:44P	7:11P	7:14P	7:41P	8:11P	9:11P	10:11P	11:11P	12:11A
West Oakland DP	3:44P	3:45P	4:14P	4:15P	4:45P	4:44P	5:15P	5:14P	5:45P	5:44P	6:15P	6:14P	6:45P		7:15P		7:45P	8:15P	9:15P	10:15P	11:15P	
Oakland Jack London	3:49P	3:50P	4:19P	4:20P	4:50P	4:49P	5:20P	5:19P	5:50P	5:49P	6:20P	6:19P	6:50P		7:20P		7:50P	8:20P	9:20P	10:20P	11:20P	
Oakland Coliseum		3:58P		4:28P	4:58P		5:28P		5:58P		6:28P		6:58P		7:28P		7:58P	8:28P	9:28P	10:28P	11:28P	
Hayward		4:05P		4:35P	5:05P		5:35P		6:05P		6:35P		7:05P		7:35P		8:05P	8:35P	9:35P	10:35P	11:35P	
San Jose Diridon AR	4:17P	4:24P	4:47P	4:54P	5:24P	5:17P	5:54P	5:47P	6:24P	6:17P	6:54P	6:47P	7:24P		7:54P		8:24P	8:54P	9:54P	10:54P	11:54P	
San Jose Diridon DP			4:50P	4:55P			5:55P	5:50P			6:55P				7:55P							
Tamien				5:00P			6:00P				7:00P				8:00P							
Morgan Hill				5:18P			6:18P				7:18P				8:18P							
Gilroy			5:21P	5:32P			6:32P	6:21P			7:32P				8:32P							
Pajaro/Watsonville			5:50P	6:01P			7:01P	6:50P			8:01P				9:01P							
Castroville			6:05P	6:16P			7:16P	7:05P			8:16P				9:16P							
Salinas			6:15P	6:26P			7:26P	7:15P			8:26P				9:26P							

2014 VISION PLAN UPDATE FINAL REPORT | CAPITOL CORRIDOR
 Capitol Corridor Joint Powers Authority

Table A-7 Schedule: Alternative B: Northbound/Eastbound:AM/Mid-Day

Northbound/Eastbound																								
Salinas										5:05A		5:45A		6:05A		6:45A		7:15A	7:45A	8:45A		10:45A		12:45P
Castroville										5:15A		5:55A		6:15A		6:55A		7:25A	7:55A	8:55A		10:55A		12:55P
Pajaro/Watsonville										5:30A		6:10A		6:30A		7:10A		7:40A	8:10A	9:10A		11:10A		1:10P
Gilroy										5:59A		6:39A		6:59A		7:39A		8:09A	8:39A	9:39A		11:39A		1:39P
Morgan Hill										6:13A				7:13A				8:23A	8:53A	9:53A		11:53A		1:53P
Tamien										6:31A				7:31A				8:41A	9:11A	10:11A		12:11P		2:11P
San Jose Diridon AR										6:36A		7:10A		7:36A		8:10A		8:46A	9:16A	10:16A		12:16P		2:16P
San Jose Diridon DP				5:20A	5:40A	5:50A	6:10A	6:20A	6:40A	6:50A	7:10A	7:20A	7:40A	7:50A	8:10A	8:20A	8:50A	9:20A	10:20A	11:20A	12:20P	1:20P	2:20P	
Hayward				5:39A		6:09A		6:39A		7:09A		7:39A		8:09A		8:39A	9:09A	9:39A	10:39A	11:39A	12:39P	1:39P	2:39P	
Oakland Coliseum				5:46A		6:16A		6:46A		7:16A		7:46A		8:16A		8:46A	9:16A	9:46A	10:46A	11:46A	12:46P	1:46P	2:46P	
Oakland Jack London				5:54A	6:08A	6:24A	6:38A	6:54A	7:08A	7:24A	7:38A	7:54A	8:08A	8:24A	8:38A	8:54A	9:24A	9:54A	10:54A	11:54A	12:54P	1:54P	2:54P	
West Oakland AR				5:59A	6:13A	6:29A	6:43A	6:59A	7:13A	7:29A	7:43A	7:59A	8:13A	8:29A	8:43A	8:59A	9:29A	9:59A	10:59A	11:59A	12:59P	1:59P	2:59P	
West Oakland DP	5:00A	5:30A	5:45A	6:00A	6:15A	6:30A	6:45A	7:00A	7:15A	7:30A	7:45A	8:00A		8:30A		9:00A		10:00A	11:00A	12:00P	1:00P	2:00P	3:00P	
Emeryville	5:05A	5:35A		6:05A		6:35A		7:05A		7:35A		8:05A		8:35A		9:05A		10:05A	11:05A	12:05P	1:05P	2:05P	3:05P	
Berkeley	5:09A	5:39A		6:09A		6:39A		7:09A		7:39A		8:09A		8:39A		9:09A		10:09A	11:09A	12:09P	1:09P	2:09P	3:09P	
Richmond	5:15A	5:45A	5:54A	6:15A	6:24A	6:45A	6:54A	7:15A	7:24A	7:45A	7:54A	8:15A		8:45A		9:15A		10:15A	11:15A	12:15P	1:15P	2:15P	3:15P	
Martinez	5:31A	6:01A	6:10A	6:31A	6:40A	7:01A	7:10A	7:31A	7:40A	8:01A	8:10A	8:31A		9:01A		9:31A		10:31A	11:31A	12:31P	1:31P	2:31P	3:31P	
Suisun	5:46A	6:16A		6:46A		7:16A		7:46A		8:16A		8:46A		9:16A		9:46A		10:46A	11:46A	12:46P	1:46P	2:46P	3:46P	
Fairfield/Vacaville	5:50A	6:20A		6:50A		7:20A		7:50A		8:20A		8:50A		9:20A		9:50A		10:50A	11:50A	12:50P	1:50P	2:50P	3:50P	
Davis	6:03A	6:33A	6:36A	7:03A	7:06A	7:33A	7:36A	8:03A	8:06A	8:33A	8:36A	9:03A		9:33A		10:03A		11:03A	12:03P	1:03P	2:03P	3:03P	4:03P	
Sacramento AR	6:11A	6:41A	6:44A	7:11A	7:14A	7:41A	7:44A	8:11A	8:14A	8:41A	8:44A	9:11A		9:41A		10:11A		11:11A	12:11P	1:11P	2:11P	3:11P	4:11P	
Sacramento DP			6:45A				7:45A				8:45A					10:15A			12:15P		2:15P		4:15P	
Roseville			7:10A				8:10A				9:10A					10:40A			12:40P		2:40P		4:40P	
Rocklin																								
Auburn																								

Table A-8 Schedule: Alternative B: Northbound/Eastbound:PM

Northbound/Eastbound																								
Salinas						2:35P										4:35P				5:45P	6:45P	7:45P		
Castroville						2:45P										4:45P				5:55P	6:55P	7:55P		
Pajaro/Watsonville						3:00P										5:00P				6:10P	7:10P	8:10P		
Gilroy						3:29P										5:29P				6:39P	7:39P	8:39P		
Morgan Hill						3:43P										5:43P				6:53P	7:53P	8:53P		
Tamien						4:01P										6:01P				7:11P	8:11P	9:11P		
San Jose Diridon AR						4:06P										6:06P				7:16P	8:16P	9:16P		
San Jose Diridon DP			3:20P		3:50P	4:10P	4:20P	4:40P	4:50P	5:10P	5:20P	5:40P	5:50P	6:10P	6:20P	6:40P	6:50P	7:20P	8:20P	9:20P	10:20P	11:20P		
Hayward			3:39P		4:09P		4:39P		5:09P		5:39P		6:09P		6:39P		7:09P	7:39P	8:39P	9:39P	10:39P	11:39P		
Oakland Coliseum			3:46P		4:16P		4:46P		5:16P		5:46P		6:16P		6:46P		7:16P	7:46P	8:46P	9:46P	10:46P	11:46P		
Oakland Jack London			3:54P		4:24P	4:38P	4:54P	5:08P	5:24P	5:38P	5:54P	6:08P	6:24P	6:38P	6:54P	7:08P	7:24P	7:54P	8:54P	9:54P	10:54P	11:54P		
West Oakland AR			3:59P		4:29P	4:43P	4:59P	5:13P	5:29P	5:43P	5:59P	6:13P	6:29P	6:43P	6:59P	7:13P	7:29P	7:59P	8:59P	9:59P	10:59P	11:59P		
West Oakland DP	3:30P	3:45P	4:00P	4:15P	4:30P	4:45P	5:00P	5:15P	5:30P	5:45P	6:00P	6:15P	6:30P		7:00P		7:30P	8:00P	9:00P	10:00P	11:00P			
Emeryville	3:35P		4:05P		4:35P		5:05P		5:35P		6:05P		6:35P		7:05P		7:35P	8:05P	9:05P	10:05P	11:05P			
Berkeley	3:39P		4:09P		4:39P		5:09P		5:39P		6:09P		6:39P		7:09P		7:39P	8:09P	9:09P	10:09P	11:09P			
Richmond	3:45P	3:54P	4:15P	4:24P	4:45P	4:54P	5:15P	5:24P	5:45P	5:54P	6:15P	6:24P	6:45P		7:15P		7:45P	8:15P	9:15P	10:15P	11:15P			
Martinez	4:01P	4:10P	4:31P	4:40P	5:01P	5:10P	5:31P	5:40P	6:01P	6:10P	6:31P	6:40P	7:01P		7:31P		8:01P	8:31P	9:31P	10:31P	11:31P			
Suisun	4:16P		4:46P		5:16P		5:46P		6:16P		6:46P		7:16P		7:46P		8:16P	8:46P	9:46P	10:46P	11:46P			
Fairfield/Vacaville	4:20P		4:50P		5:20P		5:50P		6:20P		6:50P		7:20P		7:50P		8:20P	8:50P	9:50P	10:50P	11:50P			
Davis	4:33P	4:36P	5:03P	5:06P	5:33P	5:36P	6:03P	6:06P	6:33P	6:36P	7:03P	7:06P	7:33P		8:03P		8:33P	9:03P	10:03P	11:03P	12:03A			
Sacramento AR	4:41P	4:44P	5:11P	5:14P	5:41P	5:44P	6:11P	6:14P	6:41P	6:44P	7:11P	7:14P	7:41P		8:11P		8:41P	9:11P	10:11P	11:11P	12:11A			
Sacramento DP				5:15P		5:45P		6:15P																
Roseville				5:40P		6:10P		6:40P																
Rocklin				5:49P				6:49P																
Auburn				6:07P				7:07P																

2014 VISION PLAN UPDATE FINAL REPORT | CAPITOL CORRIDOR
 Capitol Corridor Joint Powers Authority

Table A-9 Schedule: Alternative C: Southbound/Westbound:AM/Mid-Day

Southbound/Westbound																								
Auburn															6:18A									7:18A
Rocklin															6:36A									7:36A
Roseville										6:15A		6:45A		7:15A		7:45A			9:30A		11:30A		1:30P	
Sacramento AR										6:40A		7:10A		7:40A		8:10A			9:55A		11:55A		1:55P	
Sacramento DP				5:00A	5:30A	5:45A	6:00A	6:15A	6:30A	6:45A	7:00A	7:15A	7:30A	7:45A	8:00A	8:15A	8:30A	9:00A	10:00A	11:00A	12:00P	1:00P	2:00P	
Davis				5:08A	5:38A	5:53A	6:08A	6:23A	6:38A	6:53A	7:08A	7:23A	7:38A	7:53A	8:08A	8:23A	8:38A	9:08A	10:08A	11:08A	12:08P	1:08P	2:08P	
Fairfield/Vacaville				5:20A	5:50A		6:20A		6:50A		7:20A		7:50A		8:20A		8:50A	9:20A	10:20A	11:20A	12:20P	1:20P	2:20P	
Suisun				5:24A	5:54A		6:24A		6:54A		7:24A		7:54A		8:24A		8:54A	9:24A	10:24A	11:24A	12:24P	1:24P	2:24P	
Martinez				5:39A	6:09A	6:18A	6:39A	6:48A	7:09A	7:18A	7:39A	7:48A	8:09A	8:18A	8:39A	8:48A	9:09A	9:39A	10:39A	11:39A	12:39P	1:39P	2:39P	
Richmond				5:59A	6:29A	6:38A	6:59A	7:08A	7:29A	7:38A	7:59A	8:08A	8:29A	8:38A	8:59A	9:08A	9:29A	9:59A	10:59A	11:59A	12:59P	1:59P	2:59P	
Berkeley				6:05A	6:35A		7:05A		7:35A		8:05A		8:35A		9:05A		9:35A	10:05A	11:05A	12:05P	1:05P	2:05P	3:05P	
Emeryville				6:09A	6:39A		7:09A		7:39A		8:09A		8:39A		9:09A		9:39A	10:09A	11:09A	12:09P	1:09P	2:09P	3:09P	
West Oakland AR				6:14A	6:44A	6:47A	7:14A	7:17A	7:44A	7:47A	8:14A	8:17A	8:44A	8:47A	9:14A	9:17A	9:44A	10:14A	11:14A	12:14P	1:14P	2:14P	3:14P	
West Oakland DP	5:20A	5:50A	6:17A	6:20A	6:50A	6:47A	7:20A	7:17A	7:50A	7:47A	8:20A	8:17A	8:50A		9:20A			10:20A	11:20A	12:20P	1:20P	2:20P	3:20P	
Oakland Jack London	5:25A	5:55A	6:22A	6:25A	6:55A	6:52A	7:25A	7:22A	7:55A	7:52A	8:25A	8:22A	8:55A		9:25A			10:25A	11:25A	12:25P	1:25P	2:25P	3:25P	
Oakland Coliseum	5:34A	6:04A		6:34A	7:04A		7:34A		8:04A		8:34A		9:04A		9:34A			10:34A	11:34A	12:34P	1:34P	2:34P	3:34P	
Fremont Centerville	5:48A	6:18A		6:48A	7:18A		7:48A		8:18A		8:48A		9:18A		9:48A			10:48A	11:48A	12:48P	1:48P	2:48P	3:48P	
Santa Clara Great America	6:01A	6:31A	6:52A	7:01A	7:31A	7:22A	8:01A	7:52A	8:31A	8:22A	9:01A	8:52A	9:31A		10:01A			11:01A	12:01P	1:01P	2:01P	3:01P	4:01P	
Santa Clara University	6:09A	6:39A		7:09A	7:39A		8:09A		8:39A		9:09A		9:39A		10:09A			11:09A	12:09P	1:09P	2:09P	3:09P	4:09P	
San Jose Diridon AR	6:12A	6:42A	7:01A	7:12A	7:42A	7:31A	8:12A	8:01A	8:42A	8:31A	9:12A	9:01A	9:42A		10:12A			11:12A	12:12P	1:12P	2:12P	3:12P	4:12P	
San Jose Diridon DP	6:15A			7:15A			8:15A				9:15A							11:15A		1:15P		3:15P	4:15P	
Tamien	6:20A			7:20A			8:20A				9:20A							11:20A		1:20P		3:20P	4:20P	
Morgan Hill	6:38A			7:38A			8:38A				9:38A							11:38A		1:38P		3:38P	4:38P	
Gilroy	6:52A			7:52A			8:52A				9:52A							11:52A		1:52P		3:52P	4:52P	
Pajaro/Watsonville	7:21A			8:21A			9:21A				10:21A							12:21P		2:21P		4:21P	5:21P	
Castroville	7:36A			8:36A			9:36A				10:36A							12:36P		2:36P		4:36P	5:36P	
Salinas	7:46A			8:46A			9:46A				10:46A							12:46P		2:46P		4:46P	5:46P	

Table A-10 Schedule: Alternative C: Southbound/Westbound:PM

Southbound/Westbound																						
Auburn																						
Rocklin																						
Roseville								3:45P				4:45P				5:45P						
Sacramento AR								4:10P				5:10P				6:10P						
Sacramento DP				3:00P	3:30P	3:45P	4:00P	4:15P	4:30P	4:45P	5:00P	5:15P	5:30P	5:45P	6:00P	6:15P	6:30P	7:00P	8:00P	9:00P	10:00P	11:00P
Davis				3:08P	3:38P	3:53P	4:08P	4:23P	4:38P	4:53P	5:08P	5:23P	5:38P	5:53P	6:08P	6:23P	6:38P	7:08P	8:08P	9:08P	10:08P	11:08P
Fairfield/Vacaville				3:20P	3:50P		4:20P		4:50P		5:20P		5:50P		6:20P		6:50P	7:20P	8:20P	9:20P	10:20P	11:20P
Suisun				3:24P	3:54P		4:24P		4:54P		5:24P		5:54P		6:24P		6:54P	7:24P	8:24P	9:24P	10:24P	11:24P
Martinez				3:39P	4:09P	4:18P	4:39P	4:48P	5:09P	5:18P	5:39P	5:48P	6:09P	6:18P	6:39P	6:48P	7:09P	7:39P	8:39P	9:39P	10:39P	11:39P
Richmond				3:59P	4:29P	4:38P	4:59P	5:08P	5:29P	5:38P	5:59P	6:08P	6:29P	6:38P	6:59P	7:08P	7:29P	7:59P	8:59P	9:59P	10:59P	11:59P
Berkeley				4:05P	4:35P		5:05P		5:35P		6:05P		6:35P		7:05P		7:35P	8:05P	9:05P	10:05P	11:05P	12:05A
Emeryville				4:09P	4:39P		5:09P		5:39P		6:09P		6:39P		7:09P		7:39P	8:09P	9:09P	10:09P	11:09P	12:09A
West Oakland AR				4:14P	4:44P	4:47P	5:14P	5:17P	5:44P	5:47P	6:14P	6:17P	6:44P	6:47P	7:14P	7:17P	7:44P	8:14P	9:14P	10:14P	11:14P	12:14A
West Oakland DP	3:47P	3:50P	4:17P	4:20P	4:50P	4:47P	5:20P	5:17P	5:50P	5:47P	6:20P	6:17P	6:50P		7:20P		7:50P	8:20P	9:20P	10:20P	11:20P	
Oakland Jack London	3:52P	3:55P	4:22P	4:25P	4:55P	4:52P	5:25P	5:22P	5:55P	5:52P	6:25P	6:22P	6:55P		7:25P		7:55P	8:25P	9:25P	10:25P	11:25P	
Oakland Coliseum		4:04P		4:34P	5:04P		5:34P		6:04P		6:34P		7:04P		7:34P		8:04P	8:34P	9:34P	10:34P	11:34P	
Fremont Centerville		4:18P		4:48P	5:18P		5:48P		6:18P		6:48P		7:18P		7:48P		8:18P	8:48P	9:48P	10:48P	11:48P	
Santa Clara Great America	4:22P	4:31P	4:52P	5:01P	5:31P	5:22P	6:01P	5:52P	6:31P	6:22P	7:01P	6:52P	7:31P		8:01P		8:31P	9:01P	10:01P	11:01P	12:01A	
Santa Clara University		4:39P		5:09P	5:39P		6:09P		6:39P		7:09P		7:39P		8:09P		8:39P	9:09P	10:09P	11:09P	12:09A	
San Jose Diridon AR	4:31P	4:42P	5:01P	5:12P	5:42P	5:31P	6:12P	6:01P	6:42P	6:31P	7:12P	7:01P	7:42P		8:12P		8:42P	9:12P	10:12P	11:12P	12:12A	
San Jose Diridon DP			5:05P	5:15P			6:15P	6:05P			7:15P				8:15P							
Tamien				5:20P			6:20P				7:20P				8:20P							
Morgan Hill				5:38P			6:38P				7:38P				8:38P							
Gilroy			5:36P	5:52P			6:52P	6:36P			7:52P				8:52P							
Pajaro/Watsonville			6:05P	6:21P			7:21P	7:05P			8:21P				9:21P							
Castroville			6:20P	6:36P			7:36P	7:20P			8:36P				9:36P							
Salinas			6:30P	6:46P			7:46P	7:30P			8:46P				9:46P							

2014 VISION PLAN UPDATE FINAL REPORT | CAPITOL CORRIDOR
 Capitol Corridor Joint Powers Authority

Table A-11 Schedule: Alternative C: Northbound/Eastbound:AM/Mid-Day

Northbound/Eastbound																								
Salinas										4:55A		5:35A		5:55A		6:35A		7:00A	7:30A	8:30A		10:30A		12:30P
Castroville										5:05A		5:45A		6:05A		6:45A		7:10A	7:40A	8:40A		10:40A		12:40P
Pajaro/Watsonville										5:20A		6:00A		6:20A		7:00A		7:25A	7:55A	8:55A		10:55A		12:55P
Gilroy										5:49A		6:29A		6:49A		7:29A		7:54A	8:24A	9:24A		11:24A		1:24P
Morgan Hill										6:03A				7:03A				8:08A	8:38A	9:38A		11:38A		1:38P
Tamien										6:21A				7:21A				8:26A	8:56A	9:56A		11:56A		1:56P
San Jose Diridon AR										6:26A		7:00A		7:26A		8:00A		8:31A	9:01A	10:01A		12:01P		2:01P
San Jose Diridon DP				5:05A	5:30A	5:35A	6:00A	6:05A	6:30A	6:35A	7:00A	7:05A	7:30A	7:35A	8:00A	8:05A	8:35A	9:05A	10:05A	11:05A	12:05P	1:05P	2:05P	
Santa Clara University				5:08A		5:38A		6:08A		6:38A		7:08A		7:38A		8:08A	8:38A	9:08A	10:08A	11:08A	12:08P	1:08P	2:08P	
Santa Clara Great America				5:16A	5:39A	5:46A	6:09A	6:16A	6:39A	6:46A	7:09A	7:16A	7:39A	7:46A	8:09A	8:16A	8:46A	9:16A	10:16A	11:16A	12:16P	1:16P	2:16P	
Fremont Centerville				5:29A		5:59A		6:29A		6:59A		7:29A		7:59A		8:29A	8:59A	9:29A	10:29A	11:29A	12:29P	1:29P	2:29P	
Oakland Coliseum				5:43A		6:13A		6:43A		7:13A		7:43A		8:13A		8:43A	9:13A	9:43A	10:43A	11:43A	12:43P	1:43P	2:43P	
Oakland Jack London				5:52A	6:09A	6:22A	6:39A	6:52A	7:09A	7:22A	7:39A	7:52A	8:09A	8:22A	8:39A	8:52A	9:22A	9:52A	10:52A	11:52A	12:52P	1:52P	2:52P	
West Oakland AR				5:57A	6:14A	6:27A	6:44A	6:57A	7:14A	7:27A	7:44A	7:57A	8:14A	8:27A	8:44A	8:57A	9:27A	9:57A	10:57A	11:57A	12:57P	1:57P	2:57P	
West Oakland DP	5:00A	5:30A	5:45A	6:00A	6:15A	6:30A	6:45A	7:00A	7:15A	7:30A	7:45A	8:00A		8:30A		9:00A		10:00A	11:00A	12:00P	1:00P	2:00P	3:00P	
Emeryville	5:05A	5:35A		6:05A		6:35A		7:05A		7:35A		8:05A		8:35A		9:05A		10:05A	11:05A	12:05P	1:05P	2:05P	3:05P	
Berkeley	5:09A	5:39A		6:09A		6:39A		7:09A		7:39A		8:09A		8:39A		9:09A		10:09A	11:09A	12:09P	1:09P	2:09P	3:09P	
Richmond	5:15A	5:45A	5:54A	6:15A	6:24A	6:45A	6:54A	7:15A	7:24A	7:45A	7:54A	8:15A		8:45A		9:15A		10:15A	11:15A	12:15P	1:15P	2:15P	3:15P	
Martinez	5:35A	6:05A	6:14A	6:35A	6:44A	7:05A	7:14A	7:35A	7:44A	8:05A	8:14A	8:35A		9:05A		9:35A		10:35A	11:35A	12:35P	1:35P	2:35P	3:35P	
Suisun	5:50A	6:20A		6:50A		7:20A		7:50A		8:20A		8:50A		9:20A		9:50A		10:50A	11:50A	12:50P	1:50P	2:50P	3:50P	
Fairfield/Vacaville	5:54A	6:24A		6:54A		7:24A		7:54A		8:24A		8:54A		9:24A		9:54A		10:54A	11:54A	12:54P	1:54P	2:54P	3:54P	
Davis	6:06A	6:36A	6:39A	7:06A	7:09A	7:36A	7:39A	8:06A	8:09A	8:36A	8:39A	9:06A		9:36A		10:06A		11:06A	12:06P	1:06P	2:06P	3:06P	4:06P	
Sacramento AR	6:14A	6:44A	6:47A	7:14A	7:17A	7:44A	7:47A	8:14A	8:17A	8:44A	8:47A	9:14A		9:44A		10:14A		11:14A	12:14P	1:14P	2:14P	3:14P	4:14P	
Sacramento DP			6:50A				7:50A				8:50A					10:15A			12:15P		2:15P		4:15P	
Roseville			7:15A				8:15A				9:15A					10:40A			12:40P		2:40P		4:40P	
Rocklin																								
Auburn																								

Table A-12 Schedule: Alternative C: Northbound/Eastbound:PM

Northbound/Eastbound																										
Salinas						2:25P										4:25P					5:30P	6:30P	7:30P			
Castroville						2:35P										4:35P					5:40P	6:40P	7:40P			
Pajaro/Watsonville						2:50P										4:50P					5:55P	6:55P	7:55P			
Gilroy						3:19P										5:19P					6:24P	7:24P	8:24P			
Morgan Hill						3:33P										5:33P					6:38P	7:38P	8:38P			
Tamien						3:51P										5:51P					6:56P	7:56P	8:56P			
San Jose Diridon AR						3:56P										5:56P					7:01P	8:01P	9:01P			
San Jose Diridon DP			3:05P		3:35P	4:00P	4:05P	4:30P	4:35P	5:00P	5:05P	5:30P	5:35P	6:00P	6:05P	6:30P	6:35P	7:05P	8:05P	9:05P	10:05P	11:05P				
Santa Clara University			3:08P		3:38P		4:08P		4:38P		5:08P		5:38P		6:08P		6:38P	7:08P	8:08P	9:08P	10:08P	11:08P				
Santa Clara Great America			3:16P		3:46P	4:09P	4:16P	4:39P	4:46P	5:09P	5:16P	5:39P	5:46P	6:09P	6:16P	6:39P	6:46P	7:16P	8:16P	9:16P	10:16P	11:16P				
Fremont Centerville			3:29P		3:59P		4:29P		4:59P		5:29P		5:59P		6:29P		6:59P	7:29P	8:29P	9:29P	10:29P	11:29P				
Oakland Coliseum			3:43P		4:13P		4:43P		5:13P		5:43P		6:13P		6:43P		7:13P	7:43P	8:43P	9:43P	10:43P	11:43P				
Oakland Jack London			3:52P		4:22P	4:39P	4:52P	5:09P	5:22P	5:39P	5:52P	6:09P	6:22P	6:39P	6:52P	7:09P	7:22P	7:52P	8:52P	9:52P	10:52P	11:52P				
West Oakland AR			3:57P		4:27P	4:44P	4:57P	5:14P	5:27P	5:44P	5:57P	6:14P	6:27P	6:44P	6:57P	7:14P	7:27P	7:57P	8:57P	9:57P	10:57P	11:57P				
West Oakland DP	3:30P	3:45P	4:00P	4:15P	4:30P	4:45P	5:00P	5:15P	5:30P	5:45P	6:00P	6:15P	6:30P		7:00P		7:30P	8:00P	9:00P	10:00P	11:00P					
Emeryville	3:35P		4:05P		4:35P		5:05P		5:35P		6:05P		6:35P		7:05P		7:35P	8:05P	9:05P	10:05P	11:05P					
Berkeley	3:39P		4:09P		4:39P		5:09P		5:39P		6:09P		6:39P		7:09P		7:39P	8:09P	9:09P	10:09P	11:09P					
Richmond	3:45P	3:54P	4:15P	4:24P	4:45P	4:54P	5:15P	5:24P	5:45P	5:54P	6:15P	6:24P	6:45P		7:15P		7:45P	8:15P	9:15P	10:15P	11:15P					
Martinez	4:05P	4:14P	4:35P	4:44P	5:05P	5:14P	5:35P	5:44P	6:05P	6:14P	6:35P	6:44P	7:05P		7:35P		8:05P	8:35P	9:35P	10:35P	11:35P					
Suisun	4:20P		4:50P		5:20P		5:50P		6:20P		6:50P		7:20P		7:50P		8:20P	8:50P	9:50P	10:50P	11:50P					
Fairfield/Vacaville	4:24P		4:54P		5:24P		5:54P		6:24P		6:54P		7:24P		7:54P		8:24P	8:54P	9:54P	10:54P	11:54P					
Davis	4:36P	4:39P	5:06P	5:09P	5:36P	5:39P	6:06P	6:09P	6:36P	6:39P	7:06P	7:09P	7:36P		8:06P		8:36P	9:06P	10:06P	11:06P	12:06A					
Sacramento AR	4:44P	4:47P	5:14P	5:17P	5:44P	5:47P	6:14P	6:17P	6:44P	6:47P	7:14P	7:17P	7:44P		8:14P		8:44P	9:14P	10:14P	11:14P	12:14A					
Sacramento DP				5:20P		5:50P		6:20P																		
Roseville				5:45P		6:15P		6:45P																		
Rocklin				5:54P				6:54P																		
Auburn				6:12P				7:12P																		