15 Response to Comments from Businesses / Organizations

Submission 3 (James Doughty II, Doughty Enterprises, January 6, 2012)

Bay Area to Central Valley Supplemental EIR/EIS - RECORD #3 DETAIL

Status :	Pending
Record Date :	1/6/2012
Response Requested :	Yes
Stakeholder Type :	Business
Submission Date :	1/6/2012
Submission Method :	Website
First Name :	James
Last Name :	Doughty II
Professional Title :	office Manager
Business/Organization :	Doughty Enterprises
Address :	
Apt./Suite No. :	
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Email Subscription :	All Sections, Statewide Planning Only, Fresno - Bakersfield, Merced - Fresno, Sacramento - Merced, Business/Vendor Opportunities
Add to Mailing List :	Yes
Stakeholder Comments/Issues :	1.What is the social cost of carbon for construction and how many years before the added benefit equals the cost if the train's average capacity is half full? 2.When, how, and where will the high speed rail system add new branches if the train is more successfull than anticipated? 3. What pecentage of capacity does the train need to achieve to be able to pay all costs needed to operate; or "break even"?
EIR Comment :	Yes

3-77

Response to Submission 3 (James Doughty II, Doughty Enterprises, February 22, 2012)

3-77

In Question 1, it is not clear what is meant by "the social cost of carbon for construction" or what "added benefit" is meant.

The impact and benefit analyses are based on operations that meet peak demand with full trains at peak points on a line, but that result in average loads (measured as passenger miles divided by seat miles) of around 50%. This is a normal feature of linear operations and the result of unevenly distributed demand in time and space.

Peak period pricing, and geographical differences in prices can help even out such peaks and increase the load factor, and in the business planning work underway average loads have been raised to the mid 60% levels. Since the Partially Revised Draft Program EIR already assumes the average loads in the question in performing its analyses, there is no change in the analysis from being half full. With respect to Question 2, the addition of branches of service beyond the full system analyzed in the Partially Revised Draft Program EIR is not envisaged in the time frame of the analysis. If other branches were to be proposed in the future they would undergo separate environmental review at that time.

With respect to Question 3, the operational break-even point depends on the context of the analysis, and the assumptions made about fares. The simplest case is the addition of a train run to an existing service, in which the added costs are primarily those of operating and maintaining the train. Based on the 2012 Draft Business Plan, this cost is on the order of $25 to $30 per trainset mile without any allocation of the relatively fixed cost of insurance, station staffing, administration, or maintenance of infrastructure. With fares on the order of 20 cents per mile as in the draft Business Plan, the incremental break-even point would be reached with an average of 125–150 passengers on board. In a trainset of 400–500 seats, this would mean a load of 25–38%. With lower or higher fares, the break-even point would vary correspondingly.

At the other end of the spectrum, the break-even point of the entire operation is not particularly a function of the average load on the train, since the operator can reduce or add service to maintain load factors in the 50-70% range. In this case, the break-even point is determined by the volume of traffic required to cover the relatively fixed costs mentioned above. In the 2012 Draft Business Plan, Exhibit 8-16 shows that the break-even point for an initial operating segment is 17% of the forecast high ridership, once the service has grown to its long term potential.

Submission 14 (Evan Jones, Whoa Nellie Foundation, January 10, 2012)

3573

01-10-12P03:33 RCVD

John Mason,
California High-Speed Rail Authority,
770 L Street, Suite 800, Sacramento, CA 95814.

14-17 Arguing that the state's growing population warrants high-speed rail ignores another option. At a tiny fraction of the cost of HSR, an investment in family-planning services would dramatically reduce the growth of California's population, reduce unplanned pregnancies(now at over 40% of births), reduce the need for infrastructure, save billions in social costs of unwanted children, and reduce greenhouse gases and consumption of resources. A reduction of unwanted births of only 50,000 a year(0.2% of the population per year) would lower CO2 emissions more than the total emissions reduction of HSR.

Build, build, build is unsustainable. Let's break the vicious cycle now.

Also, the projected (optimistic) revenue of $4 billion would not even cover the debt-service cost for this boondoggle.

Regards,
Evan Jones, Director,
Whoa Nellie Foundation
520 P Street #33
Sacramento,CA 95814

Response to Submission 14 (Evan Jones, Whoa Nellie Foundation, January 27, 2012)

14-17

CEQA requires that an EIR study alternatives to the proposed project, or to the location of the proposed project, which are capable of reducing environmental impacts and still accomplish most project objectives. The alternative suggested in this comment would not accomplish any of the project objectives. Refer to Chapter 2 of the 2008 Final Program EIR.

Submission 16 (C. William Brewer, Motschiedler, Michaalides, Wishon, Brewer & Ryan, LLP, January 23, 2012)

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3740

01-23-12P12:14 RCVD

16-485

January 19, 2012

VIA CERTIFIED MAIL – RETURN RECEIPT

John Mason
California High Speed Rail Authority
770 L Street, Suite 800
Sacramento, CA 95814
Ph. 916-324-1541

Re: Comments to Partially Revised Draft Program EIR/EIS (Bay Area to Central Valley High-Speed Train); Opposition to A2-UPRR / Avenue 24 (Henry Miller) alignment(s); and Preferred Alternatives and Suggestions

Dear Mr. Mason,

Our firm represents Bay Valley Venture, LLC, Delta Valley Venture, LLC and United Park, Inc. (collectively, "**Clients**"), commercial property and business owners within the State Route 99 corridor in Chowchilla, Madera County, whose property and commercial enterprises are severely and adversely impacted by the recent changes to the A2-UPRR/Avenue 24 High Speed Rail alignment(s). This letter constitutes our Clients' formal written comments on the Bay Area to Central Valley High-Speed Train Partially Revised Draft Program Environmental Impact Report/Environmental Impact Statement ("**EIR/EIS**") for the California High-Speed Train Project ("**HST**"). Our Clients join the opposition of the Cities of Madera and Chowchilla and the County of Madera to the HST Project as currently proposed.

The subject commercial properties are situated at the southwest corner of Highway 99 and Avenue 24 in the City of Chowchilla, County of Madera ("**Chowchilla**"). Specifically included are the following assessor parcels: 027-053-008, 027-053-009, 027-053-010 and 027-053-011 (collectively, the "**Property**"). Clients own and operate

United Park, Inc., a retail commercial center, truck stop and fueling station, on the Property.

Our Clients oppose Route A2-UPRR/Avenue 24 (Henry Miller) alignment(s) but support A1-BNSF/Route south of SR 152 alignment(s), the latter having been proposed by the major cities in Madera County. The California High Speed Rail Authority's ("**CAHSRA**") current east-west alignment along Avenue 24/Henry Miller Road would devastate the Property, destroying our clients' expanding planned development; rendering the Property valueless for its highest and best use; forcing the relocation of the operating businesses; causing the loss of established, significant goodwill and severance damages pursuant to the provisions of the Eminent Domain Law; and triggering the payment of just compensation required by the California and United States Constitutions.

A preferred alternative that would better serve both public and private interests is the A1-BNSF/Avenue 21 alignment for the Hybrid track. The resolutions of the cities of Chowchilla and Madera, which also oppose Route A2-UPRR/Avenue 24 (Henry Miller), are consistent with our preferred alternative. Copies of these local/responsible agency resolutions are attached. Please refer to the **attached map with drawings which depict the preferred alternative Hybrid Curve "C" recommendation**.

Background: The Program EIR/EIS certified in 2005 by CAHSRA and the Federal Railroad Ad ministration ("**FRA**") evaluated alternat ive routes in the Central Valley and was followed by a subsequent Program EIR/EIS in 2008. The latter addressed the route between the Bay Area and Central Valley via Pacheco Pass (later revised in 2010). California voters conditionally approved funding for the California High Speed Rail Project in Proposition 1A in 2008.

The A1-BNSF/Avenue 21 Alternative Should be the Preferred Alignment.

CAHSRA Board Resolution 05-01 (November 2, 2005), which certified the Program EIR for the High-Speed Train System, clearly selected the BNSF (A1) alignment in Madera County as the preferred alignment. Clients, Bay Valley, Delta Valley and United Park, supported that alignment and the HST in reliance on the original Program EIR/EIS that unequivocally selected the A1-BNSF alignment as having the least adverse environmental impact among the alternatives:

> "Throughout the corridor the UP alignment passes through more urban areas and would require more aerial structures, thereby increasing

Submission 16 (C. William Brewer, Motschiedler, Michaalides, Wishon, Brewer & Ryan, LLP, January 23, 2012) - Continued

16-485

adverse impacts to communities and construction costs. Both the UP and BNSF have freight activity; however, the UP serves more local industries adjacent to the corridor that the HSR alignment would have to avoid. The HSR would typically accomplish this by using aerial structures to fly over the local freight tracks, which would add cost and cause additional adverse community impacts. The BNSF alignment traverses a more rural setting, would require fewer aerial structures and would cause fewer impacts to Central Valley communities."

"A great advantage of the BNSF alignment is that much of the HSR system could be constructed at-grade such that the freight track would be grade separated along with the adjacent HSR tracks. This would benefit freight services and communities by reducing noise (due to the elimination of horn noise and gate noise from existing services), providing improved safety, freeing automobile traffic and improving air quality through reduced congestion." (2005 Program EIR Ch. 6a pg. 6A-10)

16-486

CAHSRA's expressed reluctance to consider project alternatives proposed by responsible agencies and adversely impacted businesses, residents and land owners[1] is in itself a violation of CEQA and NEPA [CEQA Guidelines § 15126.6(a); *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal. 3d 553, 566].

For the HST project ("**Project**"), CEQA required the EIR to include analysis of "alterative locations" especially where, as here, responsible agencies, the public, landowners, residents and business owners have demonstrated alternative locations that would avoid or substantially lessen significant effects on the Project [CEQA Guidelines, § 15126.6(f)(2)]. Examples of such alternative locations meeting the above criteria are the Madera County, City of Madera and City of Chowchilla alternatives (see as per their passed resolutions, attached hereto), and the similar Bay Valley Venture and Delta Valley Venture alternatives for locating the Chowchilla area curve on the south side of SR 152 and/or Avenue 21.

NEPA also requires the consideration of alternatives – and with stronger force. A number of NEPA cases have emphasized the importance of the consideration of alternatives. For example, in *Monroe County Conservation Council, Inc. v. Volpe* (2d Cir. 1972) 472 F. 2d 693, 697-698, the Second Circuit Court of Appeals described the requirement to analyze alternatives as the "linchpin" of the environmental impact

[1] See CAHSRA Executive Summary Progress Report dated June 2010, page 6.

16-486

statement. The Council on Environmental Quality ("**CEQA**"), which promulgates regulations implementing NEPA, describes the alternatives requirement as the "heart" of an EIS (40 C.F.R. § 1502.14).

16-487

The Draft EIR/EIS is also deficient by reason of its deferral of mitigation measures into the uncertain future, without the CEQA-required articulation of specific performance criteria. The Partially Revised Draft Program EIR/EIS's inadequacy is also evident with regard to mitigation measures by the failure to make commencement of construction of the Project contingent on finding a way to meet the mitigation. The Partially Revised Draft Program EIR/EIS sections where this deficiency is evident includes the Noise and Vibration; Aesthetics and Visual Resources; and Socioeconomics, Communities and Environmental Justice sections [*Endangered Habitats League, Inc. v. State Water Resources Control Board* (1997) 63 Cal. App. 4th 777].

16-488

The Partially Revised Draft Program EIR/EIS is deficient in its cursory treatment of HST impact on land use and development, errantly concluding it is "less than significant." In light of the abundance of responsible agency comments to the contrary, substantial evidence exists supporting a fair argument that the HST Project may have a significant impact on land use. Therefore, it must be fully analyzed in the Partially Revised Draft Program EIR/EIS as to each local agency impacted, including without limitation, growth-inducing impacts [*No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal. 3d 68, 75. Public Resources Code § 21100(b)(5). CEQA Guidelines §§ 15126(d), 15126.2(d)]. This would apply to every local agency having land use planning authority, including cities and counties. Such land use authority is derived from the State Planning Act (Gov't Code § 65000 *et seq*.) and/or its charter.

16-489

The Partially Revised Draft Program EIR/EIS is deficient in its analysis of Air Quality impacts by its failure to recognize the Project's impacts in Madera County, Cities of Madera and Chowchilla, resulting in increased vehicle miles traveled ("**VMT**"). HST passengers from these jurisdictions would necessarily travel to the Merced or Fresno HST stations, thus increasing VMT. That such a fair argument can be made and supported by substantial evidence that the Project may have a significant impact on the environment by reason of the increase in VMT is certain.

The Project is subject to the Federal Clean Air Act § 309 (42 U.S.C. § 7609) and NEPA [40 CFR § 1503.1(a)] which authorize the EPA to comment on the impacts of any matter that is subject to NEPA. The California Air Resources Board is similarly vested with authority under State law (Pub. Res. Code § 2100 et seq. and Health & Safety Code §§ 38500, 38599). By its use of unsupported conclusory statements and assumptions

Submission 16 (C. William Brewer, Motschiedler, Michaalides, Wishon, Brewer & Ryan, LLP, January 23, 2012) - Continued

16-489 concerning air quality, CAHSRA has imposed an effective blockade to meaningful comment from the EPA, CARB and the public.

The intersection of two HST routes that is unique to Chowchilla and Madera County results in disproportional impacts on phased air quality, traffic, aesthetics, planned growth locally and regionally and land use planning and development. The cumulative impacts of all these unique-to-Madera County and Chowchilla issues must also be separately addressed. Absent these additional matters being given proper attention, study and analysis in the Partially Revised Draft Program EIR/EIS, it is inadequate under CEQA and NEPA as well as the Clean Air Act.

16-490 **A focused analysis of the economic social impact must be made by reason of the HSR Project's division of our Clients' Property and the City of Chowchilla**, an existing community. Under alternative alignment A2-UPRR/Avenue 24 (Henry Miller), Chowchilla is split. CEQA Guidelines § 15131(b) requires this analysis, which would appear to be absent from the Partially Revised Draft Program EIR/EIS. This analysis necessarily must also address **traffic and air pollution impacts** resulting from these divisions.

16-491 **CAHSRA's bait-and-switch change to an off-alignment "jog" to the West at SR 99 at/near Avenue 24 in Chowchilla, Madera County, creates more significant adverse environmental impacts that the preceding design.** And it violates one of the foundational requirements of Proposition 1A that the HST be located in existing travel corridors.

This jog also uniquely and unjustly destroys both the land and the business goodwill of Bay Valley and Delta Valley Ventures currently operating on adjoined parcels described above comprising 50 +/- acres. Access to the Subject Property would be substantially if not totally impaired by this "jog" that was inserted without notice or explanation as a change to the previously circulated Program EIR.

Resulting exacerbating adverse environmental impacts would be road closures, increased traffic congestion, impaired air quality in a sensitive air basin, noise, urban blight, economic loss and disruptions of established land use planning.

Economic loss, loss of jobs, urban blight and degrading social change must be addressed and analyzed in the Partially Revise Draft Program EIR/EIS as they are related to, and caused by, the physical changes which are significant impacts. CEQA and NEPA require this analysis (CEQA Guidelines, § 15382).

16-492 **The Partially Revised Draft Program EIR/EIS Analysis of Public Utilities and Energy is Misleading and Based on Speculation.**

The speculation is that "[a]lthough the HST System would result in an increase in electricity demand, it would reduce the energy demands from automobile and airplane travel, resulting in an overall beneficial effect on statewide energy use." (Partially Revised Draft Program EIR/EIS § 3.6.5.1, p. 3.6-27)

Speculation is not substantial evidence (CEQA Guidelines § 15384). The speculative statement above is utterly without evidentiary support, yet purports to justify the very foundation of CAHSRA's premise that the HST Project would result in a net decrease in statewide energy use. The assumption that airplane travel will decrease so as to consume less energy with the Project than in the before condition is pure speculation. In like manner, the assumption that automobile travel in and through and out of California would decrease because of the HST Project is nothing by speculation.

Thus, there is but superficial analysis that "assures" the public use of a dual base-line approach in the Partially Revised Draft Program EIR/EIS section on Public Utilities and Energy. Compliance with controlling CEQA authority is questionable at best (see *Woodward Park Homeowners' Assn. v. City of Fresno* (2007) 150 Cal. App. 4th 683, 707 and *Sunnyvale West Neighborhood Assn. v. City of Sunnyvale* (2010), 190 Cal. App. 4th 1351).

16-493 **The CAHSR Partially Revised Draft Program EIR/EIS is also deficient for its failure to address the large PG&E gas line and gas line easements** notwithstanding the intersecting of HST alternatives therewith. In light of the recent tragic explosions and fires in San Bruno, which had significant adverse impacts on the population and the environment, the Partially Revised Draft Program EIR/EIS should address this issue, especially with respect to construction and location alternatives for the HST.

In light of this recent history and the more recent disclosure of PG&E's sloppy monitoring and record keeping of such pipelines, some of the possible environmental impacts may include the following: (a) pollution in violation of the Federal Clean Water Act (33 U.S.C. §§ 1251-1387) and California's Porter-Cologue Water Quality Control Act (Water Code §§ 13000-149500); (b) air pollution, in violation of the Clean Air Act (42 U.S.C. §§ 7401-7671q) and Health & Safety Code §§ 39000-44474; (c) hazardous waste in violation of the Federal Resource Conservation and Recovery Act (RCRA) (42 U.S.C. §§ 6901-6992k) and California's Hazardous Water Control Act (Health & Safety Code §§ 25100-25250.28); and (d) clean up of environmental contamination as required

Submission 16 (C. William Brewer, Motschiedler, Michaalides, Wishon, Brewer & Ryan, LLP, January 23, 2012) - Continued

16-493 by the Carpenter-Presley-Tanner Hazardous Substances Account Act (California Superfund) (Health & Safety Code §§ 25300-25395.45).

16-494 For the reasons stated above, together with numerous adverse environmental impacts which we and many others are addressing, and in light of the unique and disproportional impacts on our Clients' Property, our Clients would like to propose **the attached map** depicting an alternative east-west and north-south alignment that should be analyzed by your staff, considered by the CAHSRA Board and included in the Final Environmental Impact Report.

An east-west alignment using the existing right of way of Highway 152 or Avenue 21 would provide the best benefit to the State of California, the residents of Madera County, as well as the ultimate operators and passengers of the HST. Highway 152 is one of the most dangerous Highways in the State. If the CAHSRA Board were to adopt the Highway 152 or Avenue 21 alternative it would allow for construction of additional overpasses to permit safer travel by the public, including school buses. An alignment along Highway 152 or Avenue 21 would also limit commercial strip development and other associated growth inducing impacts that may be involved. To the contrary, the A2-UPRR/Avenue 24 (Henry Miller) alignment would result in significant growth-reducing impacts, which would not have been adequately addressed. The Partially Revised Draft Program EIR/EIS is deficient in this regard, in violation of CEQA [Pub. Res. Code § 21100(b)(5) and Guidelines § 15126(d). See *Napa Citizens for Honest Government v. Napa County Board of Supervisors* (2001) 91 Cal. App. 4th 342, 368].

The design of CAHRSA's A2-UPRR/Avenue 24 (Henry Miller) and its Hybrid Avenue 24 are, on their face, counter-productive to the stated goals of the HST project, including the primary goal of train speed of 220 mph. Referring to the attached drawing depicting curves "A" and "C" and segment "B", at curve "A"; on west side of Chowchilla, the HST Hybrid route speed will be only 150 mph. However, the 220 mph target speed could easily be maintained by choosing curve "C" which we propose here. The proposed curve "C" alignment will provide a wider radius turn to maintain the target train speed at or near 220 mph to meet the programmed travel time from San Francisco to Los Angeles and vice versa.

The segment labeled "B" on the attached drawing is currently located on the north side of the State Highway 152 or north side of Avenue 21 and is in direct conflict with the City of Chowchilla's Resolution No. 27-10 passed unanimously by its City Council on April 26, 2010, copy attached. Therefore, choosing curve "C" and staying on the

16-494 south side of state Highway 152 or south side of Avenue 21 would avoid the conflict with Chowchilla's resolution opposing A2-UPRR. That resolution provides additional substantial evidence based on the avoidance or mitigation of significant environmental impacts supporting its objection to A2-UPRR/Avenue 24 alignment. Adopting alternative proposed curve "C" would also garner the support of both the cities of Chowchilla and Madera, as well as the County of Madera.

In general, we are supportive of the A1 alignment along BNSF. However, at Avenue 24, for reasons CAHSRA has been unable or unwilling to explain, rather than continuing to follow Highway 99, the alignment cuts over through a number of planned or existing industrial and commercial developments, and into the heart of Chowchilla. We would propose staying adjacent to and south of Highway 152 or Avenue 21 and on the east side of Highway 99 on the A1-BNSF alignment throughout Madera County, thereby lessening the adverse impacts to our Clients' development, Chowchilla's planned industrial property, and the commercial core of Chowchilla. We respectfully request and strongly urge CAHSRA to consider the attached proposed alternative Curve "C" alignment, in addition to the A1/BNSF alignment, and include them in all current and future environmental documents moving forward. In sum, we strongly urge CAHSRA to reconsider its current alignments through Madera County and cities of Madera and Chowchilla.

16-495 **Our Clients respectfully join in and support the concerns and comments of the Madera County Resource Management Agency and the Cities of Chowchilla and Madera** with respect to Noise and Vibration, Aesthetics, Economic and Social Effects, Land Use Planning, Local and Regional growth, Air Quality and Global Climate Change, Agriculture (including transportation, inaccurate traffic counts, Williamson Act land, conversion of Prime Ag. Land, etc.), Safety and Security, Water Resources, and Transportation.

In Madera County, locating the HST route on the west side of Chowchilla on Curve "C" would most certainly help CAHSRA achieve its goals in the following ways:

- Avoid stated conflicts in and around Clients' development, the City of Chowchilla, City of Madera and County of Madera, California;
- Meet the target speed and travel time between San Francisco and Los Angeles;
- Avoid or mitigate significant adverse environmental impacts; and

Submission 16 (C. William Brewer, Motschiedler, Michaalides, Wishon, Brewer & Ryan, LLP, January 23, 2012) - Continued

16-495

- Significantly reduce right-of-way acquisition costs, including the payment of just compensation, severance damages and loss of business goodwill.

We respectfully request CAHSRA to take appropriate steps to gain the support of the residents and agencies of Madera County, California. Thank you for your consideration of our comments and recommendations.

Very truly yours,

MOTSCHIEDLER, MICHAELIDES,
WISHON, BREWER & RYAN, LLP

C. William Brewer, P.C., Attorneys for Bay Valley Venture, LLC, Delta Valley Venture, LLC and United Park, Inc.

CWB:jsh

Enclosures: Resolutions, Letters **Opposing** A2-UPRR/Avenue 24 (Henry Miller) alignment(s) recently proposed by HSR Authority, and Drawing on Map depicting Avenue 21 alternative Curve "C":

1-City of Madera Resolution No. 10-110
2-Madera Chamber of Commerce Letter of May 13, 2010
3-City of Chowchilla Resolution No. 27-10
4-Chowchilla Chamber of Commerce Resolution No. 01-2010
5-Madera County Economic Development Commission Letter of April 30, 2010
6-Greater Madera County Industrial Association Letter of May 18, 2010
7-Drawing depicting alternative "C" hybrid route in Madera County.

cc: Bay Valley Ventures, LLC
Delta Valley Venture, LLC
United Park, Inc.

Attachment to Submission 16 (C. William Brewer, Motschiedler, Michaalides, Wishon, Brewer & Ryan, LLP, January 23, 2012)

RESOLUTION NO. 10-110

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MADERA, CALIFORNIA, SUPPORTING THE A-1 CALIFORNIA HIGH SPEED RAIL ALIGNMENT AND OPPOSING THE SELECTION OF THE A-2 ALIGNMENT

WHEREAS, California's high-speed rail project (HSR Project) is a planned transportation backbone whose initial 500 miles (phase one) will begin in Anaheim/Los Angeles, run through the Central Valley from Bakersfield to Merced, then head northwest into the Bay Area. It will travel up to 220 miles per hour and be able to make its journey from Los Angeles to San Francisco in under 2 hours and 40 minutes; and

WHEREAS, the Merced to Fresno portion of system is one of several sections that are being evaluated and studied environmentally as distinct segments. The Merced to Fresno section of the High-Speed Rail (HSR) system is 60 miles long and includes the junction that permits high-speed trains to be routed either to Sacramento or San Francisco in the north. HSR stations are proposed in downtown Merced and Fresno and a heavy maintenance and repair facility will be evaluated in the Merced to Fresno HSR project area; and

WHEREAS, of three potential alignments in the vicinity of Madera, two routes remain under consideration: A-1 (Burlington Northern Santa Fe Corridor) and A-2 (Union Pacific Corridor); and

WHEREAS, the HSR Project staff has determined that the A-1 alignment "is a viable alternative that meets the project purpose and need while also adhering to all the project objectives;" and

WHEREAS, the A-1 route represents the best opportunity to collaborate with adjacent rail corridor (BNSF), and is less expensive to construct than A-2; and

WHEREAS, the A-1 alignment in large measure will avoid the impacts created by the A-2 alignment. The A-1 alignment circumvents the City hence avoiding impacts to the downtown, businesses outside of the downtown, and properties with significant development potential outside of the downtown area; and

WHEREAS, damage to sites with potential for retail development – at Avenue 17 and 99 as well as Avenue 12 and 99 – will be avoided by the A-2 alignment. Sales tax is a major revenue source for the City's General Fund. Loss of sales tax would result in a loss of service dollars available to fund police, fire, streets, etc; and

WHEREAS, businesses forced to relocate from downtown Madera will likely have difficulty finding buildings with comparable rent structures, in close proximity – walking distance – to their customers; and

WHEREAS, unless the A-1 alignment is selected, the physical setting and scale of the rail structure associated with the elevated A-2 alignment will be inconsistent with the setting and scale of downtown Madera; and

WHEREAS, the State Auditor's recent report on the HSR business describes a seriously flawed plan, casting doubt on the timing and success of the project in its current form, and is a compelling argument that expectations of large amounts of capital mitigation funds for Madera are extremely speculative; and

WHEREAS, there are 21 locations currently competing for designation as the heavy maintenance facility, including 5 sites in Madera County. One of the Madera County sites relies on the A-1 alignment, and two additional sites would work on either route. If the preferred heavy maintenance facility site is located on the A-1 alignment exclusively, the selection of an alignment other than A-1 could cost Madera County thousands of jobs and multiple millions of dollars in investments.

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF MADERA HEREBY finds, orders and resolves as follows:

1. The above recitals are true and correct.
2. The City Council hereby identifies and supports the A-1 alignment for the HSR Project through the Madera General Plan Planning Area.
3. The City Council hereby opposes the selection of the A-2 alignment for the HSR Project through the Madera General Plan Planning Area.
4. This resolution is effective immediately.

* * * * * * * * * *

Attachment to Submission 16 (C. William Brewer, Motschiedler, Michaalides, Wishon, Brewer & Ryan, LLP, January 23, 2012) - Continued

Res. 10-110

PASSED AND ADOPTED by the City Council of the City of Madera this 19th day of May, 2010

by the following vote:

AYES: Council Members Svanda, Poythress, Mindt, Bomprezzi, Armentrout.

NOES: None.

ABSTENTIONS: None.

ABSENT: None.

GARY L. SVANDA, Mayor

ATTEST:

SONIA ALVAREZ, City Clerk

CITY OF MADERA INCORPORATED March 27, 1907 CALIFORNIA

APPROVED AS TO LEGAL FORM:
CITY ATTORNEY

By: RICHARD K. DENHALTER
5/24/10

MADERA CHAMBER OF COMMERCE

120 North E Street
Madera, CA 93638
Phone (559) 673-3563
FAX (559) 673-5009
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May 13, 2010

Mr. Curt Pringle, Chairman
California High-Speed Rail Authority
925 L Street, Suite 1425
Sacramento, CA 95814

Dear Chairman Pringle:

On April 26, 2010, the Madera Chamber of Commerce Board of Directors took official action on the proposed California High Speed Rail routes through Madera. A motion was unanimously passed opposing the A-2 route that runs through the City of Madera and supporting the A-1 route, or a version with minor modifications of the A-1 route, just east of the city.

In opposition to the A-2 route, the Madera Chamber of Commerce Board of Directors have concluded that there are far too many impacts that would devastate the residential, commercial, and industrial areas along the proposed A-2 route.

Too many commercial and industrial businesses would be displaced, and while there are funds to assist in the relocation of those affected by the proposed route, there is a concern that this would not be feasible or affordable for these businesses to do so, thus creating a great hardship. In particular, our downtown businesses provide services to those who live in the area and that have limited transportation. The end result of the high speed rail on the proposed A-2 route would eliminate these services and products to those consumers, creating a loss of client base for the downtown commercial area. The aforementioned arguments also create a concern for the loss of sales tax revenue to our city.

The Madera Chamber of Commerce questions whether the funding from mitigation would really provide what is needed to successfully resolve the negative impacts this route would leave in its' trail.

With the great task ahead of you, the Madera Chamber of Commerce Board of Directors, respectfully requests that you eliminate the proposed A-2 route and focus all future developments for the A-1 route regarding the high speed rail in Madera County.

If you, or your staff, have any questions or need additional information, please feel free to contact me at (559) 673-3563.

Respectfully,

Debra L. Bray
President/CEO
Madera Chamber of Commerce

Attachment to Submission 16 (C. William Brewer, Motschiedler, Michaalides, Wishon, Brewer & Ryan, LLP, January 23, 2012) - Continued

RESOLUTION NO. 27-10

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CHOWCHILLA SUPPORTING THE HIGH SPEED RAIL AUTHORITY ALIGNMENT DESIGNATED AS "A1"

WHEREAS, the voters of the state of California have approved funding of a high speed rail system designed to travel from Los Angeles to Sacramento to San Francisco and to points in between,

WHEREAS, the High Speed Rail Authority has selected two potential north/south routes designated as "A1" near or along the existing BNSF right of way, and "A2" near or along the UPRR right of way,

WHEREAS, The City of Chowchilla Supports the High Speed Rail System in California as a vital component to the future of the San Joaquin Valley and the entire State of California,

WHEREAS, the City of Chowchilla has actively participated in attempting to identify alternate rail routes that would minimize the impact on cities and agriculture,

WHEREAS, the placement of the east/west connection along the Hwy 152 corridor has the potential for significant negative impacts for the City of Chowchilla,

NOW, THEREFORE, LET IT BE RESOLVED that the City Council of the City of Chowchilla hereby resolves, finds and orders as follows:

1. The above recitals are true and correct.
2. The City of Chowchilla supports High Speed Rail Alignment along the Santa Fe Railroad Corridor, designated as "A1" by the High Speed Rail Authority.
3. This Alignment follows an established transportation corridor and mitigates any negative effects on the City Of Chowchilla.
4. The City of Chowchilla does not support The High Speed Rail Alignment along the Union Pacific Railroad designated as "A2" by the High Speed Rail Authority. This alignment creates short and long term negative effects on the City of Chowchilla, its retail and commercial corridors, and is not consistent with its General Plan.
5. The City of Chowchilla supports the East/West Alignment of The High Speed Rail to be placed on Avenue 21 as it enters Madera County from the west. The City further supports the East/West to North/South "Y" connection to be placed at the intersection of Avenue 21 and the Santa Fe Railroad (A1). This alignment and connection has been proposed to the High Speed Rail Staff. This connection and alignment minimizes the negative effects on farm land and the Cities of Chowchilla and Madera

PASSED AND ADOPTED by the City Council of the City of Chowchilla at a regular meeting held on the 26th day of April, 2010 by the following vote to wit:

AYES:
NOES:
ABSENT:
ABSTAIN:

Jim Kopshever, Mayor

ATTEST:

Janice Hicks) Deputy City Clerk
Cindy Black, Acting City Clerk

RESOLUTION NO. 01-2010

A RESOLUTION OF THE CHOWCHILLA DISTRICT CHAMBER OF COMMERCE SUPPORTING THE HIGH SPEED RAIL AUTHORITY ALIGNMENT DESIGNATED AS "A1"

WHEREAS, THE VOTERS OF THE STATE OF California has approved funding of the high speed rail system designed to travel from Los Angeles to San Francisco and to points in between,

WHEREAS, the High Speed Rail Authority has selected two potential north/south routes designated as "A1" near or along the existing BNSF right of way and "A2" near or along the UPRR right of way,

WHEREAS, The Chowchilla District Chamber of Commerce Supports the High Speed Rail System in California as a vital component of the future of the San Joaquin Valley and the entire State of California,

WHEREAS, Directors of the Chowchilla District Chamber of Commerce have attended public hearings provided by the High Speed Rail Authority and participated in attempting to identify alternate rail routes that would minimize the impact on The City of Chowchilla businesses and district agriculture,

NOW, THEREFORE, LET IS BE RESOLVED that the Board of Directors of the Chowchilla District Chamber of Commerce hereby resolves, finds, and orders as follows:

1. The above recitals are true and correct.
2. The Chowchilla District Chamber of Commerce supports High Speed Rail Alignment along the Santa Fe Railroad Corridor, designated as "A1" by the High Speed Rail Authority.
3. This Alignment follows an established transportation corridor and mitigates any negative affects on the City of Chowchilla.
4. The Chowchilla District Chamber of Commerce does not support The High Speed Rail Alignment along the Union Pacific Railroad, designated as "A2" by the High Speed Rail Authority. This alignment creates short and long term negative effects on the City of Chowchilla, its retail and commercial corridors, and potential loss of businesses and jobs.
5. The Chowchilla District Chamber of Commerce supports the East/West Alignment of the High Speed Rail to be placed on Avenue 21 as it enters Madera County from the West. The Chamber further supports the East/West to North/South "Wye" connection to be placed at the intersection of Avenue 21 and the Santa Fe Railroad (A1). This alignment and connection has been proposed to the High Speed Rail staff. This connection and alignment minimizes the negative effects on farm land, the Fairmead Fossil Discovery Center, major businesses along Avenue 24 and at Highway 99 & Avenue 24, and the City of Chowchilla.

PASSED AND ADOPTED by the Chowchilla District Chamber of Commerce at a special meeting held on May 21, 2010 by the follow vote to wit:

AYES: Seven
NOES; 0
ABSENT: Four
ABSTAIN: 0

Vern Moss, President

ATTEST:

Jacki Flanagan, Chamber Manager

Attachment to Submission 16 (C. William Brewer, Motschiedler, Michaalides, Wishon, Brewer & Ryan, LLP, January 23, 2012) - Continued

MADERA COUNTY EDC ECONOMIC DEVELOPMENT COMMISSION

April 30, 2010

Mr. Curt Pringle, Chairman
California High-Speed Rail Authority
925 L Street, Suite 1425
Sacramento, CA 95814

Dear Chairman Pringle:

At the April 14, 2010 Madera County Economic Development Commission (MCEDC) Board of Directors meeting a motion was unanimously passed putting the MCEDC on record opposing the proposed A-2 alignment and; unless the California High Speed Rail Authority (HSR) can propose an alternative route that is acceptable by both the cities of Madera and Chowchilla MCEDC will only support the A-1 alignment.

The major concern that MCEDC has with the A-2 route is that it will run through the middle of each of our two cities and impacts residential, commercial and industrial sites.

There are significant industrial facilities that would be negatively impacted. HSR staff has stated relocation money would be offered to these businesses, however, when an industrial site is located, it cannot be randomly relocated a ½ mile away. Industrial users select sites for very specific reasons and if forced to relocate the prospect of them remaining in Madera County, or even the State of California, is very low at best.

Displacement of commercial businesses that are operating in the Downtown Madera area would also face challenging relocation circumstances. Most all of the businesses in the downtown area service a "walking" clientele. Furthermore they are paying rental rates that are a fraction of other areas in the City of Madera and relocation would create a financial hardship on those business owners.

Future retail projects that are proposed for the Ave. 17 interchange will be harshly impaired by the A-2 alignment. Many will not move forward with existing development plans when faced with the severe impacts of the A-2 route considering the taking of key property, imposing barriers to freeway visibility and an array of other issues. This area is critical to the future commercial development for the City of Madera and can have enormous negative impacts on future revenues.

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In Chowchilla many business would also be displaced and the new "commercial/industrial" growth center would be destroyed. The newly proposed Robertson Ave/Hwy 233 Interchange would most likely have to be redesigned and future transportation routes are also in jeopardy.

There is no advantage to the cities or the county if the A-2 route is selected and the two major population centers are cut in half by a high speed rail system that will do no more than run through the County of Madera and its two cities at speeds in excess 200 MPH every 7-10 minutes not stopping until they reach either Fresno on the south or Merced on the north.

MCEDC urges that the HSR move quickly to resolve this issue as already in jeopardy is the possible loss of $5 million in Federal Economic Development Agency money. MCEDC finds it unacceptable that the HSR Board does not take immediate action to assure the hard work and expense to each city to secure the above mentioned grant funds, not to mention the future revenues generated from these projects, are not lost.

Please feel free to contact me if you or your staff has any questions regarding this matter and we are more than willing to meet with appropriate staff to expedite solving this grave problem.

Respectfully submitted,

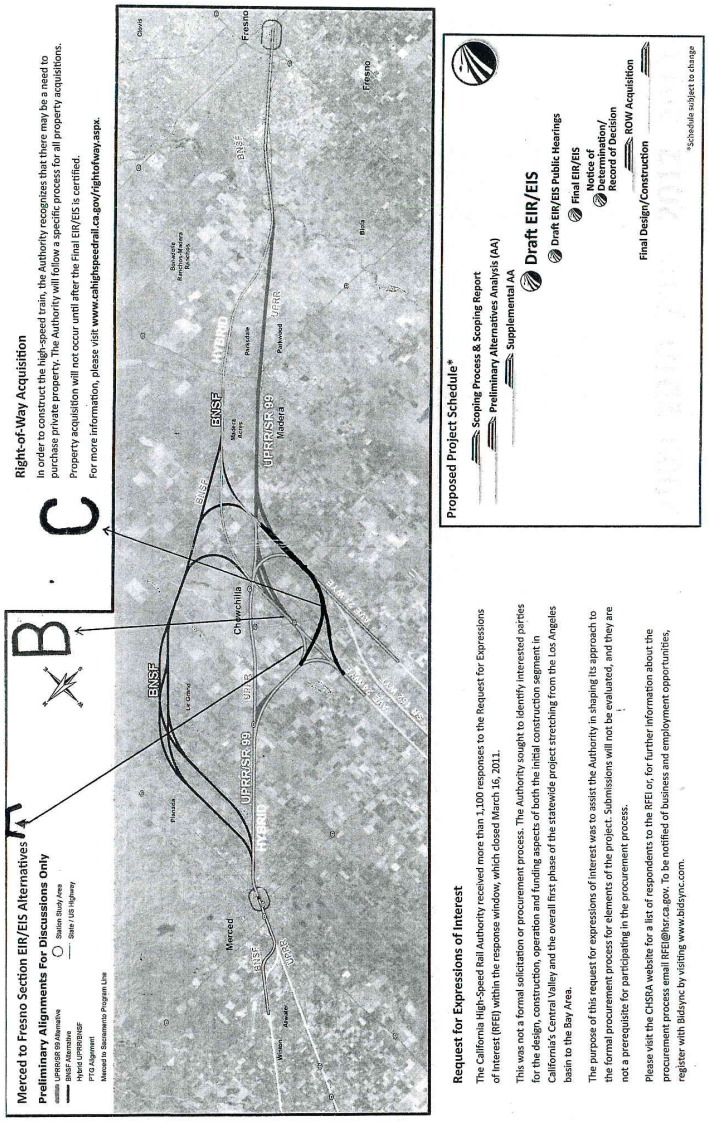
Bobby Kahn
Executive Director

Cc:
Board Members
Tom Umberg
David Crane
Rod Diridon, Sr.
Richard Katz
Lynn Schenk
Fran Florez
Judge Quentin L. Kopp
Russ Burns

Executive Director
Carrie Pourvahidi

Attachment to Submission 16 (C. William Brewer, Motschiedler, Michaalides, Wishon, Brewer & Ryan, LLP, January 23, 2012) - Continued

If HSR Authority chooses A2-UPRR, then we want them to adapt wider curve "A" going into "C" and vice versa, <u>rather than</u> smaller curve "A" going into "B". By choosing wider curve "A" going into curve "C" will help to maintain the required speed and avoid the conflict with A2-UPRR opposing resolutions approved by different cities, counties and entities.



Response to Submission 16 (C. William Brewer, Motschiedler, Michaalides, Wishon, Brewer & Ryan, LLP, March 5, 2012)

16-485

This letter is identical to one submitted on October 11, 2011 by C. William Brewer with Motschiedler, Michaalides, Wishon, Brewer & Ryan, LLP, on the Merced to Fresno Section Draft EIR/EIS; Opposition to A2-UPRR/Avenue 24 (Henry Miller) alignment(s); and Preferred Alternative and Suggestions. Because the comments contained within this letter appear to address the Merced to Fresno Section project-level environmental document, the reader is referred to the Response to Comments in the Final EIR/EIS for the Merced to Fresno Section. These comments are outside the scope of the first-tier programmatic analysis conducted for the 2012 Partially Revised Program EIR.

The Authority acknowledges the opposition of the represented property owners to the A2-UPRR/Avenue 24 (Henry Miller) alignment(s). The Bay Area to Central Valley study area does overlap in part with the study area for the Merced to Fresno second-tier project. The Authority has made clear that it will not make any decision related to the wye connection between the Bay Area and Central Valley as part of the Merced to Fresno second-tier EIR/EIS. The Authority also intends to complete its revised program EIR process prior to completing its Merced to Fresno second-tier EIR/EIS process.

The comments address details about second-tier alternatives for the east/west alignment and wye connection between the Bay Area and Central Valley. The Authority will continue detailed study of the east/west alignment and wye connection between the Bay Area and Central Valley as part of a San Jose to Merced Section second-tier EIR/EIS if the Authority selects a network alternative involving this area at the conclusion of the Program EIR process.

16-486

Refer to Response to Comment 16-485 above.

16-487

Refer to Response to Comment 16-485 above.

16-488

Refer to Response to Comment 16-485 above.

16-489

Refer to Response to Comment 16-485 above.

16-490

Refer to Response to Comment 16-485 above.

16-491

Refer to Response to Comment 16-485 above.

16-492

Refer to Response to Comment 16-485 above.

16-493

Refer to Response to Comment 16-485 above.

16-494

Refer to Response to Comment 16-485 above.

16-495

Refer to Response to Comment 16-485 above.

Submission 23 (Mike N. Oliphant, Chevron Environmental Management Company, February 8, 2012)

Mike N. Oliphant
Environmental Project Manager

Chevron Environmental Management Company
P.O. Box 6012
San Ramon, CA 94583
Tel (925) 790 6431
Fax (925) 790 6772
mike.oliphant@chevron.com

February 8, 2012

Stakeholder Correspondence – California High-Speed Rail Authority

Mr. John Mason
California High-Speed Rail Authority
Bay Area to Central Valley Draft EIR Comments
770 L Street, Suite 800
Sacramento, California 95814

Subject: **Bay Area to Central Valley High-Speed Rail Partially Revised Program Environmental Impact Report Comment**
Chevron Environmental Management Company
Historical Pipeline Portfolio–Bakersfield to Richmond

Dear Mr. Mason:

23-21

Chevron Environmental Management Company (CEMC) recently reviewed the Partially Revised Draft Program Environmental Impact Report (DEIR) for the proposed California High-Speed Rail (HSR): Fresno to Bakersfield Segment. The purpose of this letter is to notify the California HSR Authority and stakeholders as to the location of a formerly active crude-oil pipelines located in the Central Valley area (Figure 1), and to provide background information about the former pipelines. The intent is that information regarding the location and construction of this former pipeline will be incorporated into future planning and engineering documents associated with the proposed California HSR: Bay Area to Central Valley Segment.

Portions of the former Old Valley Pipeline (OVP) and Tidewater Associated Oil Company (TAOC) pipelines existed within the Central Valley footprint of the proposed California HSR: Bay Area to Central Valley Segment (Figure 1). The historic pipelines were constructed in the early 1900s and carried crude oil from the southern San Joaquin Valley to the Bay Area. Pipeline operations for the OVP ceased in the 1940s, and in the 1970s for the TAOC pipelines.

The pipelines were originally installed at depths ranging from 18 inches to 10 feet below ground surface. The steel pipelines were typically encased in a protective coating composed of coal tar and asbestos-containing felt material (ACM). When pipeline operations ceased, the pipelines were taken out of commission. The degree and method of decommission varied; in some instances the pipelines were removed, while in others they remain in place. It should be noted that the OVP and TAOC pipelines are not included in the Underground Service Alert-North (USA-North) system since they are not active pipelines.

Evidence of historical releases associated with the former OVP and TAOC pipelines is sometimes identified during the course of underground utility work and other subsurface construction activities near the former pipeline rights of way (ROWs). Residual weathered crude oil associated with former OVP and TAOC pipeline operations can usually be observed visually; however, analytical testing is necessary to

23-21

confirm the identity of the affected material. Analytical results from risk assessments performed by CEMC at numerous historical pipeline release sites confirm that soil affected by the historical release of crude oil from the pipeline is non-hazardous.

Figure 1 illustrates the location of the former OVP and TAOC ROWs within the proposed footprint of the California HSR project in Merced County, as shown in the DEIR. CEMC understands that there are several construction options being evaluated as part of the DEIR. To facilitate incorporation of the information contained in this letter into project planning and engineering documents, CEMC can provide Geographic Information System pipeline location files to project planners on request.

CEMC recommends that the California HSR Authority be prepared to potentially address residual weathered crude oil, pipelines, and ACM from the former OVP and/or TAOC systems during subsurface construction activities conducted in proximity to the former pipeline ROWs. This potentiality is easily managed with some advanced planning. CEMC would appreciate being informed of any encountered petroleum, pipeline, and pipeline-related ACM in the vicinity of the former OVP and/or TAOC ROWs.

For more information regarding these historic pipelines, please visit http://www.hppinfo.com/. If you have any questions, require additional information, or would like to request more detailed maps, please contact SAIC consultants Tom Burns (thomas.a.burns@saic.com) at (916) 979-3748 or Daniel Anzelon (daniel.b.anzelon@saic.com) at (858) 826-3316.

Sincerely,

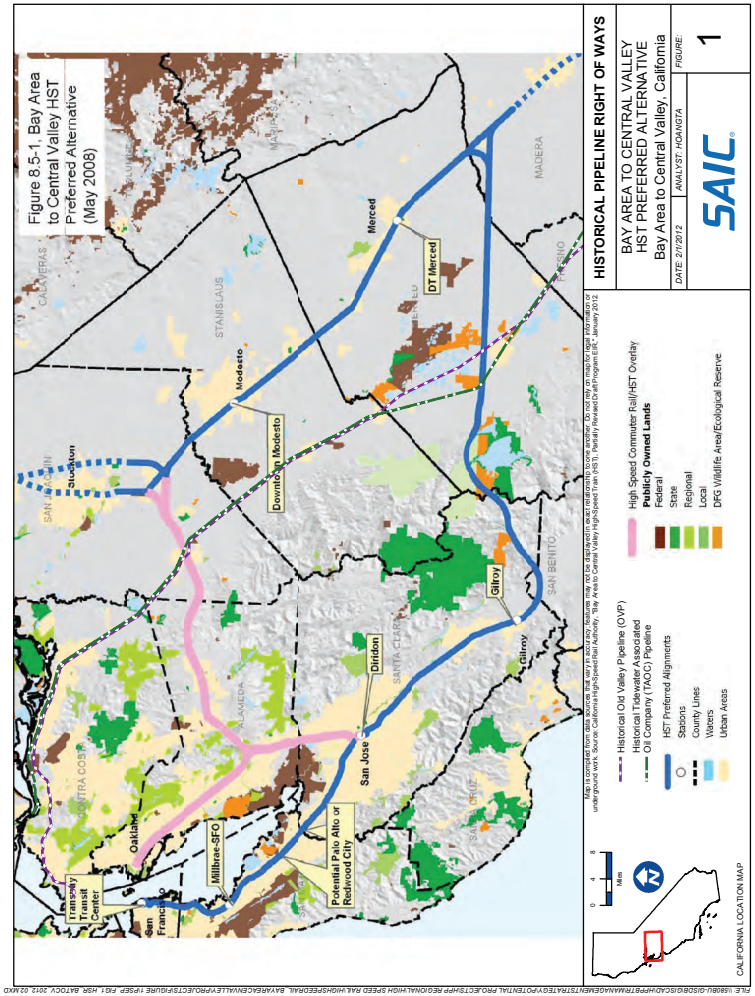
Mike Oliphant

MO/klg

Enclosures:
Figure 1. Area Map – California High-Speed Rail Project – Bay Area to Central Valley Segment

cc: Mr. Tom Burns – SAIC
3800 Watt Avenue, Suite 210, Sacramento, California 95821
Mr. Mike Hurd – SAIC (letter only)
1000 Broadway, Suite 675, Oakland, California 94607

Submission 23 (Mike N. Oliphant, Chevron Environmental Management Company, February 8, 2012) - Continued



Response to Submission 23 (Mike N. Oliphant, Chevron Environmental Management Company, February 13, 2012)

23-21

Comment acknowledged. Chapter 3.10 of the 2008 Final Program EIR assessed public utility conflicts at a broad scale, with a focus on major conflicts such as electrical transmission lines, electrical substations or power stations, natural gas pipelines, and wastewater treatment facilities as representative of utility impacts. Utilities conflicts are considered significant, and mitigation strategies were identified. Furthermore, Section 3.11.6 explains that potential hazardous materials/waste sites, which would include an analysis of potential impacts related to the former Old Valley Pipeline and Tidewater Associated Oil Company pipelines along with other known and unknown potential hazards that may be encountered during construction, will be included in second-tier project-level environmental documents. Also refer to Standard Response 3 regarding level of detail.

Submission 27 (David Dearborn, Member of the San Jose DOT/ Coalition technical working committee, February 10, 2012)

February 10, 2012

To: John Mason, California High-Speed Rail Authority
770 L Street, Suite 800
Sacramento, CA 95814

From: David Dearborn, President, Willow Glen Neighborhood Association
Member, San Jose Downtown Business and Neighborhoods Coalition
Member of the San Jose DOT/ Coalition technical working committee

27-498

Re: "Bay Area to Central Valley HST Partially Revised Draft Program EIR Comments"

Sub: Cost of viaducts, crossings and grade separation through San Jose

Ref: *"California High-Speed Rail Project Cost Changes from 2009 Report to 2012 Business Plan Capital Cost Estimates"* dated October 2011.

Ref: *SAN JOSE VISUAL DESIGN GUIDELINES* / CALIFORNIA HIGH-SPEED TRAIN INFRASTRUCTURE Draft: 9/26/11

Questions and request for information:

1) What is the total estimated cost of viaducts, crossings and grade separations through the City of San Jose from the southern City limit line to just north of Hwy 101 to the north.
2) What is the rough estimated cost of:
   a) the Lick Quarry curve / over-crossing near Monterey Road?
   b) the aerial portion between Curtner Avenue to the end of flare north of Diridon Station?

***re: Draft 2012 Business Plan Capital Cost Estimates* / Viaducts: Bay Area to Merced** (or Chowchilla):

Additional viaducts: 21-25mile (*page 10, Draft Capital Cost Est.*)
Avg 2012 cost: $50-94M /mile (*page 14 Draft Capital Cost Est.*)
"Majority of cost changes": $2.607B "in San Jose" (*pages 22 and 24 Draft Capital Cost Est.*)

Questions /request for information:

If average viaduct cost is $50-94/mile, and $2.607B is "planned for "Increase in Viaduct Lengths"; then it appears the average cost per mile is about $114M. Assuming design and construction through much of the 21-25 miles is in open less populated country in soils less prone to liquefaction it leaves unclear the cost of viaducts, crossings and grade separation of HST construction through San Jose.

From Page 10, 2012 Business Plan Capital Cost Estimates

Section	Increase in Viaduct from 2009 Report	Description for Increase in Viaduct Lengths
San Francisco – San Jose	+ 1 miles (Lo and Hi)	Total length of viaducts is similar however the viaduct widths were increased from 2-track viaducts to 4-track viaducts for an integrated Caltrain / CHSTP operation, effectively doubling the cost of the previously assumed 2-track aerial structures.
San Jose – Merced	+21 miles (Lo) +25 miles (Hi)	Added viaduct in the City of San Jose south of Diridon Station to reduce ground level impacts and to address conflicts with UPRR and Caltrain. Added viaduct between San Jose and Gilroy as constraint points are too high and too close together to bring the alignment back to the ground level and is maintained as elevated structure. Additional viaduct length for the High Cost Option is to support a downtown Gilroy station and changes in alignment in the San Joaquin Valley.

27-498

From Page 14, 2012 Business Plan Capital Cost Estimates

2009 Report Unit Price Element	2009 Report* ($1,000/mile)	2012 BP Unit Price Element	2012 BP* ($1,000/mile)
Standard Structure	45,464	Elevated – 2 Track (20' Avg. Pier Ht)	49,708
High Structure	52,552	Elevated – 2 Track (30'-50' Avg. Pier Ht)	61,554 (avg)
		Elevated – 2 Track (60'-70' Avg. Pier Ht)	83,473 (avg)
Long Span	80,495	Elevated Structure (LS) – 2 Track (20' Avg. Pier Ht)	54,849
		Elevated Structure (LS) – 2 Track (30'-50' Avg. Pier Ht)	67,928 (avg)
		Elevated Structure (LS) – 2 Track (60'-70' Avg. Pier Ht)	82,389 (avg)
Waterway Crossing	110,945	Included with LS Structure	Refer to LS Structure
Elevated Structure w/ Straddle Bents	Not included	Elevated Structure Straddle over 2 RR – 2 track (30' Avg. Pier Ht)	94,320

* Shown in 2009 $ for comparison purposes and includes contingencies

From Page 22, 2012 Business Plan Capital Cost Estimates

"The majority of the cost changes (86%) from 2009 Report to the current Low Cost Alternative include:

- **$ 2,607 million for added viaduct in the City of San Jose** to reduce ground level impacts and to address conflicts with Union Pacific Railroad and Caltrain. Also, more viaduct structures have been implemented in Central Valley avoiding impacts to natural resources "

From Page 24, 2012 Business Plan Capital Cost Estimates

Report to the Legislature December 2009 +	$	6,041		This subtotal includes those elements that are additive and not resulting from new information on site condition and stakeholder issues
+ Bridges & Viaducts	$	2,607	36%	Added viaduct in the City of San Jose to reduce ground level impacts and to address conflicts with UPRR and Caltrain.

Respectfully,

David Dearborn
1408 Hotspur Ct.
San Jose, CA 95125
cell 408.981.6599

cc: Ben Tripousis, CJS Trans. Policy Mgr.
Hans Larsen, Director, CSJ Dept. of Transportation
Scott Knies, Chair, SJDBN Coalition
Roland Lebrun, Member, Coalition Technical Team
BayArea-CentralValley@hsr.ca.gov

Response to Submission 27 (David Dearborn, Member of the San Jose DOT/ Coalition technical working committee, March 9, 2012)

27-498

The questions posed in this question relate to the 2012 Draft Business Plan published in November of 2011 and not to the Partially Revised Draft Program EIR.

The relevant cost data is available in the supporting documents to the 2012 Draft Business Plan, "Cost Changes from 2009 Report to 2012 Business Plan Capital Cost Estimates," http://www.cahighspeedrail.ca.gov/assets/0/152/302/321/02fa2469-ef00-4eb0-ac78-74edff7b4fc3.pdf

Some points to note:

1. The $2,607 million added for viaducts is for the entire section from San Jose to Chowchilla, not just in San Jose. Costs for the portion of the route to Merced are captured in the Merced to Fresno Section.
2. Unit prices for structures are provided in Section 2.6.1 of the above reference document with a summary table on p.14 providing unit costs/mile.

Questions and comment on the 2012 Draft Business Plan would best be submitted through the Authority's website: http://www.cahighspeedrail.ca.gov/contact.aspx?cat=Draft_2012_Business_Plan_Comments.

Submission 47 (Aaron Fukuda, CCHSRA [Citizens for California High Speed Rail Accountability], February 21, 2012)

CCHSRA
CITIZENS FOR CALIFORNIA HIGH SPEED RAIL ACCOUNTABILITY

February 19, 2012

Chairman Dan Richard
California High Speed Rail Authority
770 L Street, Suite 800
Sacramento, CA 95814

Subject: **Bay Area to Central Valley High-Speed Train Partially Revised DRAFT Program Environmental Impact Report Comment Letter**

Dear Chairman Richard,

The Citizens for California High Speed Rail Accountability (CCHSRA) would like to submit these comments on the Bay Area to Central Valley High-Speed Train Partially Revised DRAFT Program Environmental Impact Report as prepared by the California High Speed Rail Authority (Authority).

CCHSRA is a grassroots community organization founded to ensure that the proposed California high-speed rail project does not adversely affect the economy, environment, or the quality of life of California's existing communities. The Authority's current plan would have a devastating and negative impact on the natural environment, agricultural environment, economy and local communities of the Central Valley. After a review of the this revised Program Environmental Impact Report (Program EIR), CCHSRA also believes that the high-speed rail project will have the same impacts to the Bay Area to Central Valley alignment.

47-237

Improper Tiered Environmental Document
It should be noted that the manner in which the Authority has proceeded with the environmental review process has been flawed. The general approach adopted by the Authority has been to utilize the "tiered" approach, which is to study the entire project at a Program level and divide the project into much smaller portions to study at a project level. Given that the Bay Area to Central Valley section has been litigated and is still in the Program Level, the Authority has continued to revise and rerelease this section for public review, therefore making the Program EIR in an incomplete state. The Authority has yet to provide a complete analysis of this project at a Program Level to necessitate the release of any Project Level EIR/EIS. CCHSRA therefore recommends that all project-level EIR/EIS documentation be removed from public review and be postponed until the Program level EIR work has been completed.

47-238

"Blended" Versus 4-Track System Inconsistency
The Program EIR consistently describes the Bay Area to Central Valley section as a 4-Track system that will have the Caltrain and Freight system on two outer tracks while high-speed trains will travel in two inner tracks. Recent news reports and statements by the Chairman of the Authority indicate that negotiations and agreements are being developed to adopt a "blended" approach that will electrify the existing Caltrain/freight tracks to accommodate the high-speed rail and operate in conjunction with Caltrain and freight systems. The Program EIR does not provide any analysis of the "blended" approach nor any indication that it will be permanent or temporary. As the Authority has seen received much criticism, the standard practice of the Authority is to reach for solutions as a means for deferring criticism rather than truly finding solutions. The "blended" approach has yet to be put forth for environmental analysis, is missing from this Program EIR, and therefore cannot and should not be implemented. If the Authority intends to utilize the "blended" approach the Program EIR should be updated and release again for public review.

47-239

Urban Sprawl
As many communities in the Bay Area have pushed the limits of their development and have seen an inflation of housing costs, the Authority has failed to analyze current housing markets and pressures that could and most realistically lead to the exodus of Bay Area residents to Central Valley communities. As promoted by the Authority, the high-speed rail project is intended to offer a cost effective transportation for the San Francisco and Los Angeles residents. As residents see the allure of owning homes in the Central Valley and traveling via high-speed rail to high paying jobs in the San Francisco and Los Angeles markets, many of our Central Valley cities who have struggled with urban sprawl will potentially whitness an influx of new residents seeking affordable housing and family friendly communities. This added influx of people will put undue pressure on small rural communities to manage growth and the loss of prime farm ground. As in the past, many of the Central Valley cities have failed to curb urban sprawl and currently find themselves with blighted downtown areas and lavish and spacious residental developments on the fring on the cities.

CCHSRA requests that the Program EIR analyze the potential for residents in the Bay Area to relocate to the Central Valley with access to high speed rail. The analysis should include the number potential relocations and the distribution of thos relocations. The analysis should include an analysis of the enviromental impacts to the Central Valley cities that will see the potential influx of population and how they can and will handle the ability to serve and manage such an influx. If the impact is significant, which CCHSRA believes it will be, the Program EIR should include thos measures that can be implemented both at a State and local level to address the influx of people into the Central Valley and away from population centers like San Francisco and Los Angeles.

47-240

Specific Comments on the Program EIR
Page 1-4 Program EIR:
"Project-level EIR work is ongoing for the Merced to Fresno section, which overlaps in part with the study area for this Partially Revised Program EIR."

It should be noted that a programmatic EIR is typically used to characterize one large project related by geography, actions, rules, regulations, plans or other general criteria. It allows for a more comprehensive consideration of effects, alternatives and cumulative impacts. From the statement above and recent timeline reports by Authority staff, the Authority dangerously verges on violating the intent and purpose

Submission 47 (Aaron Fukuda, CCHSRA [Citizens for California High Speed Rail Accountability], February 21, 2012) - Continued

47-240 of utilizing a programmatic approach. As the Merced to Fresno section of the high-speed rail project has been closed from the public review and comment process, while still allowing a programmatic document that geographically interfaces with the Merced to Fresno section still out for public review, the Authority verges on predetermining alignments by proceeding in such a quick manner. Information provided in this Program EIR could impact and change the information submitted within the Merced to Fresno Project level EIR/EIS. CCHSRA would like to strongly recommend that all work on the Merced to Fresno Draft EIR/EIS cease immediately until all documentation and decisions have been finalized on the Program EIR, and that all information provided in the Program EIR be analyzed for consistency with the Merced to Fresno Project Level EIR/EIS.

Paged 2-2 Program EIR:

47-241 "The FTA Guidance Manual classifies this as a "commuter rail mainline" corridor and uses a screening distance of 375 feet from track centerline."

Did the Authority utilize 375 from the centerline of all 4 tracks or the centerline of the outer freight rail track? The impact from sound could be significantly different based on the baseline starting point for the distance from the tracks for screening. All analysis would should also take into account the cumulative impact of the fright train plus CALTRAIN plus the high-speed train. The analysis should also take into account local jurisdictional noise and vibration standards, including screening distances used by these jurisdictions.

"In the urban areas and suburban areas of the San Francisco Peninsula and San Jose, the ambient noise is estimated to range from Ldn 57 to 66 dBA. In many of the residential areas close to the international airports at San Francisco (SFO) and San Jose (SJC), the ambient levels exceed Ldn 65 dBA."

"The difference in noise level associated with freight trains being moved 20 feet closer to the sensitive land use was approximately 0.5 dBA in the 24 hour noise exposure level (Ldn) used to characterize noise impacts using FTA methodology."

The Program EIR does not provide any evidence that the 0.5 dBA increase is appropriate or scientifically determined. It is not clear if field measurements were taken and in what condition.

47-242

Page 2-4 Program EIR:
"The HST alternative in the San Francisco to San Jose Corridor is intended to be a four-track, shared use alignment that would integrate with existing Caltrain passenger service as well as UPRR freight service."

The Authority has publically advertised the use of a "blended" system, which entails the use of combined trains on a dual set of tracks. The Program EIR indicates a 4-track system which will increase impacts significantly. The Authority should indicate their intentions within the Program EIR if the "blended" approach is simply a temporary system while the additional two tracks are added. The Authority should also be consistent with their public outreach in explaining to people the "blended" approach. If this approach is to be a temporary fix toward a long term achievement of a 4-track system, this should be conveyed in the Program EIR, Public Outreach and

47-242 all other documentation. There should be absolute clarity on this issue to avoid the ongoing mismanagement of information that is been the common practice with the Authority.

47-243 Although the analysis investigated the movement of Freight trains closer to sensitive receptors the Program EIR does not analyze the overlapping sound given there is the potential for a freight train and/or Caltrain to coincide with a high-speed tainset at the same time. The Program EIR also does not analyze the increased frequency of a significant noise generator given the addition of high-speed trainsets. An environment that once only experienced freight rail or Caltrain at any given time will now have more frequent noise events and some will overlap. This same type of analysis should also be provided for vibration and its impacts to nearby receptors.

Page 2-9 Program EIR:

47-244 *"Noise barriers would be an effective strategy for mitigating Monterey Highway traffic noise as well as noise from the high-speed train."*

The Authority should provide an analysis for the impacts due to sound barriers. Often these walls are large structures that block views, introduce safety concerns and are often targets of vandalism. It should also be noted that traveling along Highway 101 and the Monterey Highway is visually a scenic route which includes rolling hills and the surrounding communities. The inclusion of sound walls will block much of this view for the traveling public and the local residents. As part of a programmatic look at mitigation measures, the Authority only provides one alternative to mitigate noise and vibration impacts of which it carries its own impacts to the environment and the traveling public. Other sound blocking techniques could includes setbacks, vegetation, trees, etc. The Program EIR is deficient in supplying viable alternatives to mitigate for significant impacts such as sound and vibration.

"Consistent with the conclusions about noise and vibration in the 2008 Final Program EIR, the above mitigation strategies are expected to reduce to a less than significant level the noise impacts from shifting the Monterey Highway, as well as the noise impacts of the potential for freight trains on the Peninsula to be closer to nearby land uses."

Again, the Program EIR does indicate that the mitigation measure will mitigate the sound to a less than significant level, however there is no discussion of the unintended impacts of the sound barriers or other mitigation features. The Program EIR proposes mitigation measures that have the potential to create unintended significant impacts which are not identified or discussed. Given the ability of project level EIR documents to tier from the Program level documents, the mitigation measures and analysis at the Program level should provide ample alternatives and analysis that a singular mitigation measure could be provided such that it solves the original impacts and does not create any secondary impact.

47-245 **Page 3-5 Program EIR:**
"The HST corridor on the San Francisco Peninsula may impact adjacent roadways by requiring right-of-way from public streets to accommodate the HST project with existing Caltrain and freight service."

Submission 47 (Aaron Fukuda, CCHSRA [Citizens for California High Speed Rail Accountability], February 21, 2012) - Continued

47-245

Given the Authority intends to approach this section as a "blended" system which share tracks, why is there a need to acquire more right-of-way. The Program EIR should be consistent with the approach intended to be followed by the Authority.

47-246

Page 4-7 Program EIR

"Within an active rail corridor, HST construction as noted above would continue on one side of the right-of-way while passenger and freight rail operations continue on the other. Once completed, Caltrain and freight service would be shifted from the shoofly tracks onto the new, permanent tracks. To complete a four-track system within an active rail corridor, additional tracks would be constructed along with the associated grade separations, permanent station platforms and signal system generally within the existing right-of-way. The last step would be to shift all HST, Caltrain and freight service to the new four-track alignment and to relinquish the temporary construction easement."

If the Authority intends to pursue the "blended" system then the use of this description is not consistent. The Bay Area is under the assumption that the "blended" system is the permanent system to be installed.

Conclusion

CCHSRA respectfully submits these comments and request that the Program EIR for the Bay Area to Central Valley be removed and revised for the above comments, and incorporate a full analysis of the "blended" system.

Sincerely,

Aaron Fukuda
Co Chairman, CCHSRA

cc: Governor Jerry Brown

Response to Submission 47 (Aaron Fukuda, CCHSRA (Citizens for California High Speed Rail Accountability), February 24, 2012)

47-237

The Authority disagrees with the commenter's assertion that the manner in which the Authority has proceeded with the environmental review process is flawed. This Program EIR is specifically designed to assist the Authority in making the fundamental choice of a preferred alignment within the broad corridor between and including the Altamont Pass and Pacheco Pass for the HST segment connecting the San Francisco Bay Area to the Central Valley. This Program EIR is tiered from the California High Speed Train Program EIR/EIS (statewide program EIR/EIS) that supported the Authority's selection of corridor alignments and station locations for the majority of the HST System. The statewide program EIR/EIS defined the broad corridor between and including the Altamont Pass and Pacheco Pass for further programmatic study that is now contained in this Program EIR. Furthermore, as described in Chapter 1 in the process of responding to the *Atherton 1* and *Atherton 2* litigation, the court has not required the Authority to halt the second-tier project-level environmental studies for the Bay Area to Central Valley Sections, which includes the Merced to Fresno and San Jose to Merced Sections. However, in the event that the Board chooses a different network alternative and/or preferred alignments than those which have previously been selected, it may be necessary to make an adjustment to the project-level environmental work currently underway.

47-238

The Partially Revised Draft Program EIR discussed the phased implementation concepts in the Draft 2012 Business Plan, and identified the blended system approach and provided a general discussion of how it would differ from a full four-track alignment on the Caltrain Corridor. Additional discussion and analysis is provided in Standard Response 1. The information in the Draft and Revised 2012 Business Plans about a blended system does not indicate a need for further revision and recirculation of the Program EIR. The analysis provided in the Program EIR is sufficient for decision making and public disclosure. A detailed blended proposal for a second-tier project is needed to provide more detailed discussion of environmental impacts in a second-tier EIR/EIS.

47-239

The growth-inducing impacts of the project as a whole have been analyzed in Chapter 5 of the 2008 Final Program EIR. This discussion identified the very high rate of growth projected under the No Project Alternative for San Joaquin and Merced Counties, as well as Sacramento County. The discussion indicates that the HST network alternatives would stimulate additional growth relative to the No Project Alternative, with the largest incremental growth occurring in the Central Valley counties. (Cambridge Systematics 2007) The chapter discusses secondary impacts of growth and how growth and indirect effects of growth can be managed. This analysis has been challenged in litigation and found adequate in the *Atherton 1* final judgment from 2009.

47-240

As indicated in this comment, this Partially Revised Final Program EIR is specifically designed to assist the Authority in making the fundamental choice of a preferred alignment within the broad corridor between and including the Altamont Pass and Pacheco Pass for the HST segment connecting the San Francisco Bay Area to the Central Valley. This document is tiered from the 2005 Statewide Program EIR/EIS that supported the Authority's selection of corridor alignments and station locations for the majority of the HST System, including alignments in the Central Valley between Merced and Bakersfield. The Statewide Program EIR/EIS defined the broad corridor between and including the Altamont Pass and Pacheco Pass for further programmatic study that is now contained in this Partially Revised Final Program EIR.

The Authority disagrees that the process it is undertaking to correct the Program EIR "verges on predetermining alignments." The Authority has taken care to be clear that it must make a new decision at the program level following completion of the corrections to the Program EIR. Please refer to Standard Response 2 for more discussion of the Authority's procedural approach to correcting the Program EIR.

This Partially Revised Final Program EIR does not and is not intended to provide a detailed analysis of the wyes connecting the San Jose to Merced Section east-west alignments with the Merced to Fresno Section north-south alignments. Any potential environmental impacts of the wyes that are not within the Merced to Fresno project footprint, including new wye alternatives developed in coordination with local agencies and the public, will be analyzed in the upcoming San Jose to Merced Section EIR/EIS if the Authority Board chooses a Pacheco Pass network alternative. If the Authority Board chooses an Altamont Pass network alternative, there may be a need for adjustments to the Merced to Fresno second-tier EIR/EIS. The Merced to Fresno Draft EIR/EIS clearly stated that it would not be used by the Authority or the Federal Railroad Administration to make a decision on the east/west alignment and wye, therefore, the Merced to Fresno Draft EIR/EIS is not pre-determinative of the programmatic network alternative. As described on Section 1.5 of this Program EIR, in the process of responding to the *Atherton 1* and *Atherton 2* litigation the court has not required the Authority to halt the second-tier project-level environmental studies for the Bay Area to Central Valley Sections, which includes the Merced to Fresno and San Jose to Merced Sections. However, in the event that the Board chooses a different network alternative and/or preferred alignments than those which have previously been selected, it may be necessary to make an adjustment to the San Jose to Merced Section project-level environmental work currently underway.

While the comment correctly notes that the comment period on the Merced to Fresno Section EIR/EIS has been closed, the project-level environmental analyses for the San Jose to Merced Section have not been completed, the San Jose to Merced Section EIR/EIS has not been released to the public, and it is not currently under public review.

47-241

Please refer to Response to Comment 40-270 for a discussion of why the screening distance used is a conservative assessment, consistent with FRA and FTA guidance.

47-242

The Draft 2012 Business Plan discussed a blended system approach for an alignment between San Francisco and San Jose along the Caltrain Corridor. The Partially Revised Final Program EIR discusses the blended system approach in Chapter 5. Please also refer to Standard Response 1 for more discussion and for an explanation of how continued consideration of a four-track alignment for the Caltrain Corridor in the Program EIR is consistent with CEQA. More detailed planning work is necessary to define the parameters of a blended system approach for an alignment between San Francisco to San Jose on the Caltrain Corridor. Based on information developed for the 2012 Draft Business Plan, it is anticipated that a blended system approach would provide sufficient capacity for the initial HST service (2-4 trains per hour per direction "in the peak period") between San Francisco and San Jose in 2029. As passenger demand on the HST system grows, the Authority in partnership with Caltrain will continue to evaluate both operational and infrastructure based solutions for supplying additional passenger capacity. Depending on the outcome of that capacity analysis, additional environmental clearance may be required and the public will be invited to participate in that process.

47-243

The FRA screening methodology for program-level evaluations is based on identifying the number of sensitive receptors that could be exposed to significant increases in noise over a 24-hour period using a scale weighted to account for increased sensitivity to nighttime exposure. Conservative screening distances provided by FRA and FTA are used to accomplish this. In the program-level evaluation, the corridor centerline is established in order to compare between alignment alternatives, but specific track configurations are not determined until an alignment is selected.

The project-level analysis will evaluate in detail the totality of noise from all three train sources (freight, Caltrain, HST) taking into account the location of tracks on which they would operate within the right-of-way. According to FRA methodology, the project-level noise analysis considers noise exposure over a 24-hour period, thereby capturing a weighted average of the noise of all trains in the corridor and the times that they operate. In this manner, the analysis will capture the potential for increased ambient noise due to additional train frequency and any new tracks or movement of tracks. The project analysis will also account for the effect on operational noise due to the elimination of train horn usage in the corridor as a result of grade-separating the alignment.

Detailed vibration effects at individual receptors will also be evaluated in the project-level noise and vibration analysis, consistent with FRA methodology. The methodology for project-level evaluations indicates that existing condition information should be captured through measurements in the corridor. Operational conditions for all train service in the corridor will be modeled. The existing ambient vibration conditions will be used as a baseline. The analysis will evaluate the potential vibration from each rail source (freight, Caltrain and HST). The significance of vibration impact will be determined using the criteria in the FRA methodology.

47-244

The Partially Revised Draft Program EIR addresses those topics identified in the final judgment/order for the *Atherton 1* and *Atherton 2* litigation as requiring corrective work under CEQA. The range of noise mitigation strategies and potential secondary effects from the use of these mitigation strategies were one of those topics.

The design of noise barriers appropriate for the proposed HST would depend on the location of noise-sensitive buildings after Monterey Highway and the freight train tracks haves been shifted, as well as the speeds of the HST, the track elevation, and structure type. More detailed consideration of noise impacts and mitigation measures such as the height of soundwalls or other noise reducing measures will be included in project-level environmental documents.

Secondary effects, such as visual impacts, relating to the use of noise mitigation strategies were considered at a very broad scale, which is appropriate for this program-level of analysis. Furthermore, although these program EIRs provide a base from which project-level EIRs may tier from, they do not restrict the type of mitigation measures that may be considered to mitigate impacts. The aesthetic and community effects of sound barriers will be addressed in more detail as part of second-tier project development and environmental review when it will be possible to identify specific locations and size of sound barriers. With respect to Monterey Highway, the corridor already includes many soundwalls and property walls of varying age, condition, and associated landscaping (Kiesling, Memorandum on Existing Sound Barriers/Property Walls along Monterey Highway, 2012). With implementation of the project, these existing walls may be replaced with consideration of maintaining a high level of visual quality in neighborhood areas by implementing such measures as visual buffers, trees, and other landscaping, architectural design, and public artwork as noted in Chapter 3.7 of the 2008 Final Program EIR. Refer to Chapter 7A in the Partially Revised Final Program EIR for an additional mitigation strategy regarding the aesthetic treatments of sound walls, which would apply regardless of location along the HST system.

47-245

If the Authority selects a network alternative that uses all or a part of the Caltrain Corridor between San Francisco and San Jose, the Authority has the flexibility to consider a blended system approach to implementation at the second tier of project planning and environmental review. The Authority must complete its first-tier decision, and it will then be in a position to determine whether and how to proceed with a blended system on the Peninsula. The Partially Revised Draft Program EIR addressed the possibility of the need to acquire public street right-of-way to support a four-track system which was considered in the Alternatives Analysis prepared for the project. As discussed in Chapter 3, the acquisition of public street right-of-way could result in the loss of existing travel lanes which could increase traffic congestion. As discussed in Standard Response 1, if a blended system approach is pursued at the second

tier, the level of right-of-way needed for implementation would be vastly reduced as compared to a four-track alignment.

47-246

The comment is referring to text about construction impacts for a four-track alignment on the San Francisco Peninsula. Please refer to Standard Response 1, explaining why continued discussion of a four-track alignment on the Caltrain Corridor is consistent with CEQA.

Submission 48 (Gary A. Patton, Community Coalition on High-Speed Rail [CC-HSR], February 21, 2012)

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February 21, 2012

John Mason
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Attention: Bay Area to Central Valley HST Partially Revised Program EIR Comment

RE: Comments Submitted on Behalf of Community Coalition on High-Speed Rail
Sent By Email – BayArea-CentralValley@hsr.ca.gov

Dear Mr. Mason:

This comment letter is submitted on behalf of the Community Coalition on High-Speed Rail ("CC-HSR"). CC-HSR is a grassroots, non-profit corporation, based on the San Francisco Peninsula, that is working to make sure that the proposed California High Speed Rail project doesn't adversely affect the economy, environment, or quality of life of California's existing communities. In addition to comments contained in a letter to be separately submitted by CC-HSR and other organizations, CC-HSR has the following comments on the *Bay Area to Central Valley High-Speed Train Partially Revised DRAFT Program Environmental Impact Report* released for public comment on January 6, 2012:

48-247

1. As you know, the California High-Speed Rail Authority ("Authority") has now been ordered by the Superior Court in Sacramento County to rescind its approval of the most recent program level EIR for the Bay Area to Central Valley portion of the proposed high-speed train project. So far, the Authority has not yet taken that action. CC-HSR believes that seeking comments on a new draft document, when another and different document is currently certified as *the* program level EIR for the Bay Area to Central Valley portion of the proposed high-speed train project, is premature. We believe that the Authority may properly solicit comments on a new Draft EIR document only after the Board of Directors of the Authority has taken action to decertify the current document, and has directed that a new document be circulated, properly describing the project the Authority is then proposing. We object to the effort to "rush" this document through the environmental review process required by the California Environmental Quality Act (CEQA), and believe that all members of the public should be given at least 45 days to review a document that the Authority's Board of Directors has specifically ordered be circulated, to address the legal deficiencies identified by the Superior Court, and generally to provide an adequate environmental review of the proposed action, as further outlined in this comment letter.

48-531

2. The importance of the point made in Comment #1 is highlighted by the fact that the Authority has made major modifications to its proposed project since the certification of the current EIR document for the Bay Area to Central Valley portion of the statewide project. One important change included in the "Business Plan" issued by the Authority in November 2011 identifies a "blended system" approach in the Bay Area. Despite the claims made in the current Draft EIR, beginning on page 5-3, this modification to the project, as now contemplated by the Authority, not been properly analyzed in the *Bay Area to Central Valley High-Speed Train Partially Revised DRAFT Program Environmental Impact Report* circulated for comment on January 6, 2012. As an example, the use of the "blended system" approach on the Peninsula would result in significant impacts to residents, businesses, and communities by way of possible street closures, noise, vibration, and related effects. These have not been outlined and analyzed, as CEQA requires. That deficiency in the description of and analysis of the new project now being contemplated by the Authority must be remedied, and a revised draft document must then be recirculated for further public comment.

48-532

3. Comment #2 reflects the requirements of the California Environmental Quality Act (CEQA), which demands that the Draft EIR made available for public comment accurately reflect the actual "project" being proposed. According to reliable information, including many news reports quoting the Chairperson of the Authority and the Governor of the State of California, the Authority is planning shortly to revise its proposed project once again – and in potentially very significant ways. If it does so, the Draft EIR circulated for comment must accurately outline the actual "project" being proposed for implementation by the Authority. It is worth emphasizing that the "agency" which is proposing the project is the Authority. Actions of the staff and consultants to the Authority, not ratified or endorsed by any action of the Authority's Board of Directors, are not the kind of actions that can support the kind of responsible environmental review that CEQA demands. In short, the public needs to know what the actual "project" is that the Authority proposes, before it can be asked to make comments on a Draft environmental document. The fact that the document currently being circulated for comments is a so-called "program level" EIR does not obviate this fact. The overall project being proposed has changed significantly since the Program Level EIR for the rest of the state was certified (without challenge) in July 2008. Since an important portion of the proposed system was not determined at that time (namely, the Bay Area to Central Valley portion of the proposed statewide system), any "program level" EIR for that segment must reflect the currently-proposed statewide project. Again, that project is not accurately disclosed or analyzed in the current Draft EIR. If the project is again changed by the Authority, prior to certification of the program level EIR for the Bay Area to Central Valley section of the project, the Draft EIR circulated for public comment must describe and analyze the then-proposed project.

48-533

4. The fact that comments are being made by individuals and groups not residing in the geographic area covered the Bay Area to Central Valley Draft EIR underscores the importance of Comment #3. Because the Authority did not certify a program level EIR for the entire statewide project in 2008, the changes now being proposed are of critical importance to those potentially affected in all areas of the state. The "program" for the

Submission 48 (Gary A. Patton, Community Coalition on High-Speed Rail [CC-HSR], February 21, 2012) - Continued

48-533 entire state, in other words, is not yet clear, and when significant changes are made in the project, those changes must be analyzed in a program level EIR, and everyone in the state must be given an adequate opportunity to understand what is being proposed and to comment. The changes in the statewide project made by the most recent "Business Plan" affect the statewide "program," and have not been adequately documented, described, or analyzed in accordance with the requirements of CEQA. If further significant changes are made in the near future, before the certification of the program level EIR for the Bay Area to Central Valley portion of the statewide project (and this is what statements from the Chairperson of the Authority indicate will happen), then the EIR document must also describe and analyze the actual project then being proposed, and the public must be given an opportunity to comment.

48-249 5. The Authority claims that comments on the *Bay Area to Central Valley High-Speed Train Partially Revised DRAFT Program Environmental Impact Report* should be limited to the materials contained within that document. We disagree. The standard that is set in *Laurel Heights Improvement Assn. v. Regents of University of California* (1993) 6 Cal.4th 1112 is that public comment must be allowed if there is new information or changed circumstances that have arisen since the EIR was last circulated, which is the case here. CC-HSR objects to the Authority's effort to dissuade the public from making comments as allowed by law.

48-250 6. The *Bay Area to Central Valley High-Speed Train Partially Revised DRAFT Program Environmental Impact Report* states, at page 1-4, that the Authority is working on a "project level" EIR for a section of the proposed project from San Jose to Merced. Once the Authority has rescinded its approval of the EIR found invalid in the recent decisions of the Superior Court mentioned on page 1-1, there will not be any adopted alignment between San Jose and the Central Valley. This comment reinforces the earlier comments: the Authority is acting like it can make up its mind on what route it will use between the Bay Area and the Central Valley before it has completed a legally-sufficient EIR. This is a fundamental violation of CEQA.

48-536 7. The Authority also believes, apparently, that it can continue to work on a "project level" EIR for an alignment that has not yet been legally selected, and then disregard the information it develops in doing that "project level" analysis as it makes a determination of what route it will select at the "program level." Again, this is a fundamental violation of CEQA. While it is true, as the Draft EIR says at Page 1-4, that the "court has not required the Authority to halt its second-tier, project-level environmental studies for the Bay Area to Central Valley sections…," this does not mean that the court has validated a process by which the Authority can ignore information that is relevant to the program level determination, when that information is actually and currently available. Environmental work done on both the San Jose to Merced section and the San Jose to San Francisco section must be analyzed in the program level document, and the current Draft EIR is deficient because it has not done that. CC-HSR asks that all pertinent information be reviewed and included in a new Draft Program Level EIR for the Bay Area to Central Valley portion of the statewide project, and that the revised document then be circulated for public comment. Concerns of communities on the San Francisco Peninsula have been

48-536 shortchanged in this program level review because of the failure of the Authority to consider the information developed in its so-called "Alternatives Analysis." This is a serious deficiency and must be corrected.

48-251 8. The apparent rejection of below grade options along the Caltrain alignment on the Peninsula (one of the conclusions of the Authority's "Alternatives Analysis") will result in a certainty of noise, vibration, and other impacts to Peninsula communities which must be documented, and explained (and upon which public comments must be permitted), so that the Authority can properly determine whether an alternative that eliminates or reduces the use of the Caltrain right of way is not a preferable way to connect the Bay Area to the Central Valley. Again, the current environmental impact analysis is inadequate and fails to meet the requirements of CEQA.

48-252 9. On page 5-3, the *Bay Area to Central Valley High-Speed Train Partially Revised DRAFT Program Environmental Impact Report* notes that new information has been developed on the use of the Altamont Corridor, subsequent to the Authority's 2010 Revised Final Program EIR for the Bay Area to Central Valley portion of the statewide system. Again, the Authority is not allowed to disregard this information, as it does its environmental review at the program level. The current Draft environmental document does not examine the implications of the new information that the Authority now has on the Altamont alignment, and it must do so, to comply with CEQA. The Authority needs to redo the current Draft EIR, to take account of that information, and then circulate the revised document for public comment.

48-253 The CC-HSR respectfully requests the Authority to proceed as follows: (1) take the actions required by the Superior Court and rescind the Authority's previous certification of the EIR for the Bay Area to Central Valley portion of the proposed statewide HST system; (2) simultaneously vacate the Authority's determination to achieve the Bay Area to Central Valley connection through the Pacheco Pass alignment; (3) subsequent to the promulgation of the next version of the Authority's "Business Plan," outlining the "project" that the Authority wishes to pursue, utilize all available information, including information generated by the Authority in its work on "project level" environmental analyses, and it work on the Altamont Corridor Rail Project, to complete a program level EIR for the Bay Area to Central Valley portion of the proposed project; and (4) circulate that new Draft EIR for public comment, accepting comments on all the environmental issues related to the project as then defined by the Authority.

Thank you for taking these comments into consideration, and for fully complying with the requirements of the California Environmental Quality Act.

Yours truly,

Gary A. Patton, Of Counsel
WEATHERFORD & PARKIN, LLP
Attorneys for Community Coalition on High-Speed Rail

Response to Submission 48 (Gary A. Patton, Community Coalition on High-Speed Rail (CC-HSR), February 24, 2012)

48-247

Comment acknowledged. Please Refer to Standard Response 2 regarding the Authority's procedural approach to complying with CEQA in light of the final court judgment/order and ongoing second-tier project work.

48-531

The Authority has not changed its first-tier project. The Draft 2012 Business Plan and the Revised 2012 Business Plan likewise do not change the first-tier project. The environmental implications of a blended system approach are discussed in Chapter 5, as well as in Standard Response 1, at a programmatic level of detail. The Authority does not agree that the first-tier EIR must be revised and recirculated again based on implementation details about a second-tier project.

48-532

The Authority agrees that an EIR must describe the project being proposed. At the first-tier, the Partially Revised Draft Program EIR and Partially Revised Final Program EIR does this. The first-tier project is selection of the general network alternative, alignments, and station locations for the Bay Area to Central Valley HST connection. Chapter 5 describes the environmental implications of phased implementation, including a blended system approach, to ensure that even at a programmatic level the environmental impact implications are appropriately disclosed and considered. As explained in Standard Response 1, detailed analysis of a blended system approach to implementing HST in the Caltrain Corridor must analyzed at the second-tier after it has been developed and described in more detail.

48-533

The Authority agrees that the discussion in the Draft and Revised 2012 Business Plan about phasing implementation of the statewide HST system and the blended system approach for "bookend" sections in the Bay Area and Los Angeles area are of critical importance to those outside the Bay Area to Central Valley study area. The Authority does not agree, however, that the statewide HST system has changed or is otherwise unclear. As explained in Standard Response 1 and Standard Response 2, as well as the Revised 2012 Business Plan, the portion of the statewide HST system that is not yet finalized is the general route from the Central Valley into the Bay Area. Depending on the outcome of the Program EIR process, some discussions in the Revised 2012 Business Plan about phasing and the blended system approach would be subject to adjustment and refinement as part of second-tier projects.

48-249

The Authority has followed CEQA Guidelines Section 15088.5 in crafting its notices and introductory text for the Partially Revised Draft Program EIR. That Guideline specifically provides that a lead agency may request that reviewers limited their comments to the materials that have changed. The Authority's process has therefore complied with CEQA.

Moreover, the Authority deliberately and thoroughly considered whether new information and changes conditions since the EIR last circulated would result in a need to change any of the prior analysis in Chapter 5, entitled "New Information and Changed Conditions Since September 2, 2010, Prior Decisions." The public was invited to comment on the materials in Chapter 5, and the Authority received extensive comments on this chapter. The Authority therefore disagrees with the comment that its process has dissuaded the public from making comments allowed by law.

48-250

The Authority has proceeded with second-tier planning and environmental analysis work while litigation on the Authority's 2010 Revised Final Program EIR was underway. During the ensuing

litigation, the Authority's quasi-legislative decisions are presumed adequate. Moreover, the Superior Court did not enjoin the Authority from engaging in second-tier planning and environmental review. The Authority disagrees that the environmental work that it has undertaken on a second-tier project from San Jose to Merced violates CEQA. It is not uncommon for lead agencies to undertake first-tier and second-tier planning concurrently. Please refer to Standard Response 2 discussing the Authority's procedural approach to complying with CEQA in light of the final court judgment/order and ongoing second-tier project work.

48-536

The Authority has not ignored information developed in the San Francisco to San Jose and the San Jose to Merced second-tier project and EIR processes. Chapter 5 specifically addresses the information being generated from the project-level work. The Partially Revised Draft Program EIR is intended to address information included in the second-tier process that the Superior Court determined must be considered as part of the first-tier EIR.

To the extent the comment implies that CEQA requires a second-tier level of detail in the first-tier EIR, the Authority respectfully disagrees with this perspective. The tiering process allows a lead agency to focus its EIR on the scope of the decision at hand.

48-251

The comment incorrectly states that the Authority has rejected below grade alignments for the Caltrain Corridor between San Francisco and San Jose. As part of the first-tier project to choose a network alternative to connect the Bay Area and the Central Valley, the Authority will not make a decision on the vertical profile of the track. The vertical profile of the track is a design detail that will be considered as part of second-tier project planning and environmental review if an alignment between San Francisco and San Jose is included in the selected network alternative in whole or in part. The Superior Court in the *Atherton 1* case held this approach complied with CEQA.

In addition, the noise, vibration, and other impacts on Peninsula communities of the HST have in fact been studied extensively, at a first-tier or programmatic level of detail. The Authority does not agree with the comment that these issues have not been studied adequately in the existing programmatic EIR process.

The Authority placed its work on a second-tier project for San Francisco to San Jose on hold in May 2011. No decisions have been made about a second-tier project or the scope of environmental analysis in a second-tier EIR. At this time, it is anticipated that any further work on a second-tier project would have to start afresh, with a new second-tier planning and CEQA process and a new notice of preparation.

48-252

The comment suggests that the Authority is required to evaluate information being developed for the separate, slower speed regional commuter rail project called the Altamont Corridor Rail Project as part of this Program EIR. Section 5.1.2 explains that in preparing the Partially Revised Draft Program EIR, the February 2011 Preliminary Alternatives Analysis Report was reviewed to determine whether any information in it would result in a need to make revisions to the Program EIR analysis. The text explains that further revisions are not necessary.

Furthermore, in the *Atherton 2* case, the Superior Court concluded that the Authority's preliminary planning information on the Altamont Corridor Rail Project, including its inclusion of a potential corridor south of Livermore, did not undermine the range of alternatives in the Program EIR, which had preliminarily considered and rejected such a corridor for HST service. The Authority has further considered the Altamont Corridor Rail Project information and explained that it has concluded there is no need for further EIR revisions. The comment does not specifically identify any particular facts that would require further revision. No further revisions to the range of alternatives, impacts analysis, or mitigation measures are required.

Refer to Response to Comment 56-124 regarding a discussion of the Altamont Corridor Rail Project and how it differs from the HST project.

48-253

Comment acknowledged. As described in Section 1.4 of the 2012 Partially Revised Draft Program EIR, the *Atherton 1* and *Atherton 2* court rulings require the Authority to rescind its certification of the 2010 Revised Final Program EIR and to make a new decision based on this 2012 Partially Revised Final Program EIR. The 2012 Partially Revised Draft Program EIR contains the new analysis necessary to comply with the judgment of the court on all of the items listed in this comment. Based on that analysis as well as the information contained in this 2012 Partially Revised Final Program EIR, the Authority will decide whether or not to:

1. Certify this Partially Revised Final Program EIR (including the 2008 Final Program EIR and the 2010 Revised Final Program EIR) for compliance with CEQA
2. Approve findings of fact, a statement of overriding considerations, and a mitigation monitoring and reporting program in compliance with CEQA
3. Approve a network alternative, preferred alignments, and preferred station locations for further study in project-level EIRs. The Authority disagrees that additional analysis is required related to the new information and changed conditions and that recirculation would also be required.

Refer to Standard Response 3 for a discussion of an appropriate level of detail in this first-tier document, and Standard Response 2 for a discussion of procedures and processes.

Submission 52 (Scott B. Birkey, Preserve Our Heritage, February 21, 2012)

Bay Area to Central Valley Supplemental EIR/EIS - RECORD #52 DETAIL

Status :	Pending
Record Date :	2/21/2012
Response Requested :	
Stakeholder Type :	Other
Submission Date :	2/21/2012
Submission Method :	Project Email
First Name :	Scott B.
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Professional Title :	Partner
Business/Organization :	Preserve Our Heritage
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Add to Mailing List :	
Comment Type :	Issue (concern, suggestion, complaint)

52-418

Stakeholder Comments/Issues :

John Mason
California High-Speed Rail Authority
770 L Street, Suite 800
Sacramento, CA 95814

Dear Mr. Mason:

On behalf of Preserve Our Heritage, we are submitting comments on the January 2012 Bay Area to Central Valley High-Speed Train Partially Revised Draft Program Environmental Impact Report ("Draft EIR") for the Bay Area to Central Valley High-Speed Train project (the "Project") prepared by the High Speed Rail Authority ("HSRA") pursuant to the California Environmental Quality Act ("CEQA").

Introduction and Summary

Preserve Our Heritage is an organization comprised of farmers and other agricultural interests in the Madera and Merced area of the California Central.. Valley. Preserve Our Heritage's members have lived and farmed in this region for generations, and they pride themselves on being good stewards of the land. After reviewing the Draft EIR, Preserve Our Heritage has significant concerns regarding the adequacy of the Draft EIR.

In summary, the Draft EIR inappropriately assumes a tiered environmental approach, and fails to evaluate urban sprawl and other growth-inducing effects resulting from the Project. Moreover, specific instances in the Draft EIR demonstrate the HSRA has given short shrift to even this revised environmental analysis of the Project in violation of CEQA.

The Draft EIR Improperly Assumes a Tiered Approach

A lead agency may "tier" EIRs for a sequence of actions so that the later EIRs incorporate and build on the information in the previous EIRs. (Pub. Res. Code Sections 21068.5, 21093; 14 Cal. Code Regs. Section 15152.) Tiering is only appropriate, however, when the lead agency is able to rely on a completed programmatic EIR that has been certified by the lead agency. (Pub. Res. Code Section 21094.) Only then may the lead agency determine whether the later, smaller project may rely on the overall programmatic EIR. Because the EIR for the Bay Area to Central Valley route is not complete, there is no completed, overall programmatic level of analysis from which the HSRA may tier project-level EIRs. As such, the HSRA's project-level EIRs -- such as the Merced to Fresno Draft EIR -- are all tiering off of an incomplete programmatic analysis. This is a violation of CEQA.

In addition, a second-tier EIR is invalid if the first-tier EIR is invalidated, even in those instances when the lawsuit challenging the first-tier EIR was not decided before the second-tier EIR was certified. (Friends of Santa Clara River v. Castaic Lake Water Agency (2002) 95 Cal.App.4th 1373.) The Draft EIR here has been the subject of much litigation. Two court decisions have found that the HSRA failed to comply with CEQA. (Atherton I; Atherton II.) These deficiencies infect the entire overall programmatic level of analysis for the High-Speed Rail Project, and cast doubt on the legitimacy and adequacy of that environmental review. Accordingly, the environmental review of any project-level EIR relying on the overall programmatic level of analysis is infected by the deficiencies identified by the courts in Atherton I and Atherton II. HSRA should hold back on issuing any further project-level EIRs and recirculating existing project-level EIRs until the Bay Area to Central Valley analysis and the rest of the overall project have been deemed sufficient by a court.

Submission 52 (Scott B. Birkey, Preserve Our Heritage, February 21, 2012) - Continued

The Draft EIR Fails to Evaluate Growth-Inducing Impacts

52-419 An EIR must describe any growth-inducing impacts of the proposed project. (Pub. Res. Code Section 21100(b)(5); 14 Cal. Code Regs. Section 15126(d).) For example, an EIR must discuss the ways in which the project could directly or indirectly foster economic or population growth or the construction of new housing in the surrounding environment. (14 Cal. Code Regs. Section 15126.2(d).) Put simply, an EIR must evaluate urban sprawl and other growth-inducing impacts that could result from a project.

The Draft EIR here failed to include any analysis of growth-inducing impacts related to either the Project as a whole or those portions of the Project analysis that have been revised in the Draft EIR. This, too, is a violation of CEQA. Shifting Monterey Highway and moving freight tracks closer to adjacent land uses along the San Francisco Peninsula could displace thousands of residents and businesses, who will be forced to relocate further outside existing urban areas as a result. These relocated land uses will take up space on the fringes and beyond existing development, creating classic urban sprawl. Yet none of these impacts are identified, let alone evaluated, in the Draft EIR. The EIR's failure to review these impacts is inconsistent with the California Supreme Court's decision Muzzy Ranch Co. v. Solano County Airport Land Use Comm'n (2007) 41 Cal.4th 372, which found that growth-displacement effects resulting from a restrictive land use regulation is subject to CEQA review.

Specific Comments on the Draft EIR

52-421 Page 1-4: The Draft EIR states that the wye interchange for the Merced to Fresno section is analyzed in the Merced to Fresno Draft EIR. This is not true. The Merced to Fresno Draft EIR half-heartedly mentions impacts related to the Avenue 21 and Avenue 24 wyes, but indicates that ultimately the wye will be chosen based on the anticipated Merced to San Jose EIR/EIS. Moreover, the Draft EIR states that the HSRA will examine wyes in a subsequent project-level EIRs. All of this is textbook project-chopping and piecemealing, masking the overall project's true environmental impacts in violation of CEQA. (See Bozung v. Local Agency Formation Comm'n (1975) 13 Cal.3d 263.)

52-420 Page 3-17: The Draft EIR claims to evaluate the potential loss of traffic lanes parallel to the CalTrain right-of-way along the San Francisco Peninsula, and the loss of traffic lanes along the Oakland to San Jose corridor in the City of Hayward. The Draft EIR does not evaluate, however, how traffic impacts related to this loss of traffic may affect traffic outside the Bay Area and closer to the Merced to Fresno interchange. That analysis should consider, for example, whether travelers will use a different route to reach the Central Valley, and whether those choices will impact traffic closer to the Central Valley alignment.

52-421 Page 5-1: See comment regarding page 1-4 above.

52-422 Page 5-3: The Draft EIR refers to the Draft 2012 Business Plan. This Business Plan was released in November 2011 and purports to represent an implementation strategy for construction of the high-speed rail system. The Business Plan includes a significant amount of new information related to the high-speed train system's phased implementation approach and the "blended system" concept. This constitutes new information of substantial importance, which requires recirculation of the Draft EIR. (Pub. Res. Code Section 21166; 14 Cal. Code Regs. Section 15162.) Thus, the Draft EIR must be recirculated to take into account this additional information.

Conclusion

Thank you for the opportunity to submit comments on the Draft EIR. We look forward to your responses to the concerns raised above. We urge you to do this project right rather than continuing to push forward with HSRA's current ill-conceived approach to planning and environmental analysis of the high-speed train system.

Best regards,
Scott Birkey

Scott B. Birkey | Cox, Castle & Nicholson LLP | 555 California Street, Floor 10, San Francisco, California 94104 | direct: 415 262 5162 | fax: 415 392 4250 | sbirkey@coxcastle.com

Subscription Request/Response :
EIR Comment : Yes
Attorney Comment : Yes
General Viewpoint on Project (BACV) :

Response to Submission 52 (Scott B. Birkey, Preserve Our Heritage, February 24, 2012)

52-418

The comment about tiering under CEQA is acknowledged. The Authority does not agree with the commenter's interpretation of CEQA tiering rules. The comment, however, appears to be directed at the Merced to Fresno second-tier, project-level EIR/EIS rather than the content of the Partially Revised Draft Program EIR.

The Authority and the Federal Railroad Administration completed a Final Programmatic EIR/EIS for the Statewide HST system in 2005. This 2005 Programmatic EIR/EIS supported final first-tier decisions on preferred alignments for much of the statewide HST system. The Bay Area to Central Valley Program EIR is intended to support a first-tier decision on how to connect the HST between the Bay Area and Central Valley. The Authority intends to complete its Program EIR process prior to completing its second-tier, project EIR/EIS process for the Merced to Fresno Section.

52-419

The growth inducing impacts of the project as a whole are identified in the 2008 Final Program EIR. This analysis has been challenged in litigation and found adequate in the *Atherton 1* final judgment from 2009.

The discussion in the Partially Revised Draft Program EIR regarding the shift of Monterey Highway and the potential for freight trains to travel on outside tracks of a four-track alignment on the Peninsula will not catalyze growth or impacts from growth in a manner different that already identified in the 2008 Final Program EIR. The shifting of Monterey Highway and the implementation of a four-track alignment on the San Francisco Peninsula will result in some property acquisition, which has already been discussed in the 2010 Revised Final Program EIR. The Authority is committed to minimizing relocations to the extent possible within engineering constraints, and would attempt to obtain sufficient right-of-way within existing public property, undeveloped areas, landscaped areas, or lower intensity commercial development. Specific relocations will be identified and avoided if possible during the project-level evaluation. Consistent with the information provided in Chapter 5 of the 2008 Final Program EIR, the Authority does not anticipate the displacement of a large number of people from private property who would then relocate to the Central Valley.

52-421

The comment about the Authority's analysis of the east/west alignment and wye for the HST system at the second-tier is acknowledged. The Authority does not agree that its approach to its second-tier EIRs.

52-420

The potential loss of travel lanes along the Peninsula due to the HST project is anticipated to have an extremely localized effect on traffic. The potential loss of capacity may occur on minor collector or arterial roadways whose primary function is to distribute traffic between origins and destinations locally. Even at this level, significant effects to traffic congestion been only been identified at a few intersections and only during peak hours. The major highways and freeways that serve traffic between the Bay Area and the Central Valley would not lose capacity or see increases in congestion, and it is not anticipated that travel patterns to and from the Central Valley would change.

52-422

The Authority disagrees that the Draft 2012 Business Plan triggers further revision and recirculation of the Partially Revised Draft Program EIR. Chapter 5 of the Partially Revised Draft Program EIR discusses the Draft 2012 Business Plan and its implementation strategy for the HST system as a whole. Standard Response 1 provides further information and discussion about the blended system and the way implementing the blended system affects environmental impacts.

Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012)

Transportation Solutions Defense and Education Fund

P.O. Box 151439 San Rafael, CA 94915 415-331-1982

February 21, 2012
By E-Mail

John Mason
California High-Speed Rail Authority
770 L Street, Suite 800
Sacramento, CA 95814

Re: Bay Area to Central Valley HST Partially Revised Draft Program EIR Comments

Dear Mr. Mason:

56-104 The following comments are offered on behalf of the Transportation Solutions Defense and Education Fund ("TRANSDEF"), the Planning and Conservation League, the Community Coalition on High-Speed Rail and the California Rail Foundation (collectively, "Commenters"). The Partially Revised Draft Program EIR ("PRDPEIR") for the Bay Area to Central Valley High-Speed Train project discloses ten significant and unavoidable impacts (p. 1-5[1]) resulting from the implementation of the Pacheco Pass Alternatives--impacts that had not been identified in the 2008 and 2010 Program EIRs. These impacts would not have been identified absent Commenters' litigation. After a review of these newly identified impacts and new information made available since the certification of the 2010 Revised Final Program EIR ("RFPEIR"), it is clear to Commenters that the California High-Speed Rail Authority is obligated under CEQA to study an Altamont Corridor Rail Project San Francisco/San Jose alternative that has not previously been studied, because it would avoid the major impacts of the other network alternatives. The results of that study will then need to be recirculated in a newly revised draft PEIR.

A. Impact Analyses

56-105 Noise and Vibration
The screening distance used in the noise analysis is not the screening distance required by the FTA Guidance manual: "375 feet from **track centerline**." (p. 2-2, emphasis added.) The analysis uses a screening distance "measured from the **centerline of the rail corridor**." (p. 2-4, emphasis added.) The analysis should have used a screening distance of 375 feet from the outer track centerline, not the corridor centerline. A correct application of screening distance would study the impacts on the narrow linear strip adjacent to the area studied. The conclusion on page 2-5 that "the limited expansion of the existing Caltrain rail corridor has little to no effect on the number of properties captured in the screening analysis or to the noise and vibration effects to properties just outside the right-of-way" is thus both conclusory and inadequate. It does not establish that the impact metric, population per mile (Table 2-1, p. 2-2), for this narrow strip is consistent with the adjacent area that was studied. The calculated noise and vibration differences of 0.5 dBA and 2.4 Vdb, respectively (p. 2-5), are unsupported without the inclusion of the underlying technical work. The PRDPEIR had no technical appendices.

56-106 Monterey Highway
As a result of Commenters' litigation, a map is offered showing the locations of lane reductions and right-of-way shifting on Monterey Highway. (Figure 2-2.) Its absence in the 2010 Revised Final Program EIR/EIS (RFPEIR) was one of the reasons that document failed as a full disclosure document for the project. This map is still inadequate, however, as it does not depict the location of the UPRR tracks or provide arrows indicating the direction of the shift.

The litigation also resulted in the disclosure of detailed traffic congestion maps (Figures 3-2 through 3-5.) They indicate that narrowing Monterey Highway will make a highly congested region even more congested. However, by limiting the metric to the unnecessarily broad "LOS E or worse," the maps and analysis fail to address what is perhaps the most important question to the public: will the road network descend into gridlock, experiencing LOS F as a result of the roadway narrowing? The text hints at the answer, but fails to be definitive: "If the peak hour of travel demand is fully occupied, then travelers then shift their time of travel to shoulder hours as a function of time and space." (p. 3-16.) The public needs to know if this project will create more LOS F, which would increase travel times, and make traveling at peak hour even more onerous.

56-107 Peninsula Lane Closures
The analysis of the impact of lane reductions omits the critical information of what capacity would remain after the reductions. (p. 3-6.) It is unclear from the text as to whether the analysis in Tables 3-1a and 3-1b represents the cumulative impact of all the lane reductions, or the impact of each reduction studied separately. It is also unclear from the text whether enough intersections were studied to fully capture the cumulative impacts of traffic diverted onto other local roads. (see footnote 7, p. 3-6.) Commenters' litigation demonstrated this to have been a problem with the previous analysis of the Monterey Highway lane reductions. Also, it is unclear from the text what the cumulative impact would be on a motorist going through more than one impacted intersection. Detailed mapping of the lane reduction vicinities, intersection labeling, and the study of intersections much further away from the roads in question are all necessary to establish the scale of the areas impacted.

To be consistent with the CEQA Significance Criteria identified on page 3.1-3 of the 2008 FPEIR, the analysis needs to evaluate whether the increase in LOS for some of the intersections (e.g., Page Mill Rd./El Camino Real, p. 3-10) exceeds the LOS standard established by the respective county congestion management agencies. The

[1] All page references are to the PRDPEIR unless otherwise noted.

Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

56-107 FEIR must do this analysis, or identify each intersection projected to have an higher LOS designation as a result of lane closures as a significant impact. Unless this is done, the analysis will be inadequate under CEQA.

The lane closure analysis produced bizarre and counterintuitive results: some lane closures improved traffic by a whole LOS level, and some intersection delays went to zero (e.g., Whipple Ave./Stafford St., p. 3-9.) In the absence of a detailed explanation as to how this is even possible, these data must be considered invalid as substantial evidence.

The proposed mitigations for the lane closure impacts include the generic suggestion of the adjustment of vertical alignments. Because specific relevant information was developed in the project level environmental review, a list of generic mitigations is not adequate. The proposed mitigations need to be screened for feasibility, based on the existing feasibility analyses contained in documents such as the August 2010 Supplemental Alternatives Analysis Report (see e.g., SARA 413 & 417).

Construction Impacts

56-108 It appears that the new Section C, focused on Monterey Highway (p. 4-4), was initially written with the intent of supplementing the 2008 FPEIR. A later decision to delete the entire Section C (p. 4-5) failed to fully coordinate the texts. Some of the typical generic impacts (e.g., handling of waste pavement) were left out of the new Section C.

B. New Information and Changed Conditions

Ridership Peer Review Group Reports

56-109 Sections 4.3, 4.4, and 4.5 of the July 2011 Independent Peer Review Final Report of the California High-Speed Rail Ridership and Revenue Forecasting Process confirm the criticisms of the ridership model that were raised in Commenters' letters on the RFPEIR. (attachment 1.) The August 2011 Peer Review Final Report (attachment 2) states on page 6 that "We continue to believe that a better solution would have been to fully re-estimate the model in ways described in our first report." On page 7, the report states "That said, we still believe that every effort should be made to eliminate the use of such a large set of constants in future versions of the model. They represent current travel patterns that may not hold true under future conditions." It appears that the Peer Review Group grudgingly accepted the explanations and conclusions offered by Cambridge Systematics, with obvious misgivings. This doesn't change the opinion of the Institute for Transportation Studies that the model's results are unreliable for public investment purposes. (see *infra*.)

Project Section Profile Variations

56-110 As demonstrated in the August 2010 Supplemental Alternatives Analysis Report (e.g., SARA 413 & 417), for some subsections of the Peninsula portion of the project, no vertical alternatives other than aerial viaduct appear feasible. If it is known that no other way to build a subsection is possible, the impacts of that vertical alignment need to be studied at the program level. The Authority appears to argue that the SAA report is only

56-110 preliminary. If so, what additional studies are needed to solidify the analysis and clarify whether other vertical alignments are feasible? Why can't such studies be done now? Deferring such analysis to the project level deprives the program level selection of a preferred alternative of vital impact information. This is why it is untrue that "[t]his type of design detail [horizontal placement and profile variations] is appropriately considered in second-tier, project-level environmental documents because it does **not prevent** adequate identification of the impacts of the programmatic decision at hand." (p. 5-1, emphasis added.) It is equally untrue that "[n]o decision will be made at the program level regarding how to accomplish grade separations or whether to close certain roads." (p. 5-9.) One might argue that an infeasibility determination is not the same as a "decision," but that would be semantics--a distinction without a difference.

Altamont Corridor Rail Project

56-111 The conclusion that "the information related to the Altamont Corridor Rail Project does not necessitate further revision of the Program EIR" (p. 5-3) is deeply flawed. In fact, the 2011 Altamont Corridor Rail Project's Preliminary Alternatives Analysis shows that an Altamont Corridor Rail Project route (with appropriate adjustments) would be far more consistent with the project's adopted objectives listed in Table 6-1 (p. 6-5) than the PRDPEIR's Preferred Alternative.

The compilation of public input on the selection of the preferred alternative (starting on p. 6-6) depicts a highly controversial decision--one for which there is no public consensus. A careful analysis of the public input yields four major environmental objections to the various Network Alternatives: 1). impacts on the Don Edwards Wildlife Refuge; 2). impacts on the Grasslands Ecological Area; 3). impacts on Peninsula communities; 4). sprawl inducement.

The 2011 Altamont Corridor Rail Project Preliminary Alternatives Analysis ("PAA") demonstrates that feasible Altamont alternatives exist that avoid each of these impacts, when combined with a blended approach (see discussion, *infra*) that would eliminate the four-track cross-section throughout the Caltrain Corridor. Westbound Altamont trains would reverse direction while loading in the San Jose Terminus, and head to San Francisco on the Caltrain Corridor. (While this extension of service to San Francisco would represent an expansion of the Altamont Corridor Rail Project operational plan, the additional rail infrastructure would be limited to the blended approach) already being considered for the Caltrain Corridor.

The Altamont Corridor Rail Project alternatives that were recommended to be carried forward into the EIR/EIS process met all the following criteria:

- Alternative meets the project goals and objectives and project purpose and need in providing an improved and competitive regional intercity and commuter passenger rail service that maximizes intermodal connections between the Northern San Joaquin Valley

Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

56-111

and Bay Area and that complements the high speed train system.

- Alternative has no environmental or engineering issues that would make approvals infeasible.
- Alternative is feasible or practical to construct.
- Alternative reduces or avoids adverse environmental impacts. (PAA, p. 2-7)

Ms. Alexis's comment letter (RFPEIR, p. 15-42) points out how the ridership model projects that the Pacheco route gains 13.9 million riders when a San Francisco destination is added to a San Jose-only network alternative. It would then be entirely logical to add that same number of riders to the 94.6 million riders projected for an Altamont route with a San Jose terminus, to create a 108.5 million rider estimate for an Altamont Corridor Rail Project San Francisco/San Jose alternative. This calculation shows an Altamont Corridor Rail Project San Francisco/San Jose alternative exceeding the Preferred Alternative by 14.6 million annual riders, a 15.5% increase in ridership. This analysis remains uncontroverted, as the Authority did not honor Ms. Alexis' request to run the model with this alternative.

This increase in ridership will have a significant positive impact on HST revenues, as the Bay Area's boardings are estimated to make up 35% of the system's 2030 boardings for a San Jose-San Fernando Bay to Basin Scenario. (California High-Speed Rail 2012 Business Plan, Ridership and Revenue Forecasting, draft technical memorandum,Table 5.14.) The outstanding performance of this alternative stands in sharp contrast to one of the PRDPEIR's key conclusions "that both Pacheco Pass and Altamont Pass alternatives have high ridership potential and that ridership and revenue do not differentiate between these alternatives." (p. 6-17.)

By bringing all trains to San Jose, this Altamont Corridor Rail Project San Francisco/San Jose alternative avoids the criticism that "the most promising Altamont Pass alternatives would split HST services (express, suburban express, skip-stop, local, regional) between two branch lines to serve San Jose and either San Francisco or Oakland--reducing total capacity of the system to these markets." (p. 6-21.)

"The preliminary AA report evaluation confirms that a regional and inter-city commuter rail route is feasible for travel through the Altamont Corridor." (*Id.*, p. 5-9.) The Alameda Corridor will be able to support HST equipment:

> In addition, once improved to be fully grade-separated and electrified, with appropriate signaling and train control systems, the Altamont Corridor could support operation of California HST System trains and lightweight multiple-unit passenger equipment compatible with those trains. As such, the Altamont Corridor could allow selected California HST

56-111

> System trains to serve regional stops within the Altamont Corridor and to allow regional trains operating within the Altamont Corridor to reach additional destinations within the California HST System (e.g., Sacramento or Merced). (*Id.*, p. 2-3.)

56-112

The question then becomes, could the Altamont Corridor Rail Project be analyzed as an HSR network alternative? The PRDPEIR, without foundation, says no. It characterizes the Altamont Corridor Rail Project as "a substantially slower commuter/intercity rail service that does not meet the design requirements for a high-speed train network alternative." (p. 6-18.) Clearly, that condition resulted from the design brief given to the project team. There is no evidence in previous FPEIRs that there are any speed-limiting factors specific to the Altamont Corridor. On the contrary, the Altamont Corridor Rail Project "is being designed to 150 mph (rural) speeds." (*Id.*, p. 3-36.) Although the route will "have an average speed of 70- to 90- mph (including stops)" (*Id.*, p. 2-7), there is not enough information available to the public to be able to estimate the travel time involved in an express HST trip from Los Angeles to San Francisco on any of the alignment alternatives for this route. A study of this alternative is needed to prepare a proper travel time estimate.

The Network Alternatives report (using routes that are allegedly different from the Altamont Corridor Rail Project alignment alternatives) showed an LA-SJ time of 2:19 for an Altamont San Jose Terminus alternative (FPEIR, p. 7-18), which is ten minutes longer than the Pacheco LA-SJ time. (*Id.*, p. 7-48.) If the Altamont Corridor Rail Project were able to attain the express speeds of the Altamont network alternatives, that would result in an LA-SF time of 2:48, ten minutes longer than the Pacheco LA-SF time of 2:38. (*Id.*) There is not enough information available to the public to be able to compare the operational speeds of the network alternatives and the Altamont Corridor Rail Project alignment alternatives. Because of the alternatives' potential to greatly reduce the project's environmental impacts, careful study of the potential to increase operational speeds is needed.

56-113

To help meet the Proposition 1A requirement of a 2:40 LA-SF trip time, a wye from either of alternatives EB-4 or EB-6 could be installed near Santa Clara to allow San Francisco express trains to turn north there. (See map, PAA, p. 3-16.) This would save the several minutes the short trip to San Jose would take, along with its respective dwell and turnaround times. If the travel time estimate was still more than 2:40, a speed optimization effort should be made, to see where higher express speeds can be achieved.

56-114

The key difference between the Altamont Pass Network Alternatives that were previously studied and the Altamont Corridor Rail Project alignment alternatives is the avoidance of the Don Edwards Wildlife Refuge. In addition, it is Commenters' understanding that the Altamont Corridor Rail Project alternatives were designed to avoid the riparian and property impacts cited in the FPEIR at pp. 7-19 & -20 in the Niles

Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

56-114 Canyon/Sunol Valley. Before criticizing these alternatives for impacts they don't have[2], a detailed study of the route design in the Niles Canyon/Sunol Valley area is needed.

56-115 With two lawsuits directly challenging the Authority's failure to adequately plan the Pacheco route in light of the UPRR's refusal to share its right-of-way, it is bizarre to read that "In addition, UPRR's position denying use of its rights-of-way for HST tracks presents a greater implementation challenge for the Altamont Pass network alternatives than for the Pacheco Pass Network Alternative serving San Francisco via San Jose." (p. 6-18.) No evidence was offered to substantiate this assertion, nor were any citations to previous EIRs offered. This statement would appear to not apply to the alternatives being studied by the Altamont Corridor Rail Project, as the very first goal of the Project is to "[d]evelop a regional intercity and commuter passenger rail service in the Altamont Corridor linking the northern San Joaquin Valley with the Bay Area that provides dedicated trackage separate from existing lines shared with Class 1 freight operations where feasible." (2011 Altamont Corridor Rail Project Preliminary Alternatives Analysis, p. 2-1.) At a minimum, the Setec Alternative, proposed by Commenters, captured in part by Altamont Corridor Rail Project alternatives EBWS-1, TV-4, and ALT-2, was professionally designed to avoid UPRR rights-of-way.

An Altamont Corridor Rail Project route would also eliminate the ten new significant and unavoidable impacts identified in this PRDPEIR, each which was Pacheco-related. Because such a route, in combination with the blended system approach, would eliminate the most serious environmental impacts of any network alternative studied to date, it must be studied as an alternative, after which a further revised draft must be recirculated, prior to selecting a preferred alternative. That study would, of course, investigate whether an Altamont Corridor Rail Project can meet the HSR design requirements. Because the study will mostly involve compiling and analyzing already existing information, it should not be onerous or time-consuming.

Because the CHSRA's Chair is a former BART director, it might now be feasible for the Authority to negotiate with BART to take over its Dublin line and regauge it for HSR and HSR-compatible regional service. (See Commenters' scoping comments for the Altamont Corridor Rail Project, attachment 3.) That would greatly reduce the environmental and community impacts of building new transportation infrastructure in the Tri-Valley, while better connecting the Valley with San Joaquin County, where many of its employees live. Livermore would receive an excellent rail connection, and avoid the uncertainty of waiting for the funding of an eventual BART extension. If such a route were implemented, the impacts would be strikingly lower, invalidating the assertion that "[t]he Pacheco Pass Network Alternative serving San Francisco via San Jose is least disruptive to communities because it is designed to use existing, publicly owned rail and

[2] The RFPEIR criticized Commenters' Setec Alternative as appearing to have the same impacts to high value aquatic resources and threatened and endangered species as the FPEIR's SR-84/South of Livermore alternative (RFPEIR, p. 15-208 - 209), despite the statement within the Setec report that "[t]his new proposed Altamont alternative entirely avoids Niles Canyon and sensitive Sunol Creek areas." (RFPEIR, p. 15-110.)

56-115 highway right-of-way as a method of minimizing environmental and community impacts." (p. 6-22.) Such an alignment should be included when studying an Altamont Corridor Rail Project alternative.

The Draft Business Plan Proposes A New Project Alternative

56-116 The Draft Business Plan (released November 2011) introduces the key new concepts of a blended system and blended operations: "Blended services linking statewide high-speed rail service with regional and local transit systems will benefit travelers in the near term and provide the platform for continued improvement in rail transportation. Connectivity and mobility will improve significantly across the state by expanding the network of interconnected public transportation systems and can be expedited through early investments in the regional systems." (Draft Business Plan, p. 2-1.) "As further improvements are made, blended operations progress to the point where transfers would not be necessary, and passengers could have a "one-seat ride" on a train that is able to travel over both the high-speed line and upgraded regional rail lines." (*Id.*, p. 2-3.)

The Business Plan is explicit in identifying two pathways to implement the Phase 1 HST project:

> Step 4: San Francisco to Los Angeles/Anaheim (Phase 1)
>
> Completion of the Bay to Basin system leads to Phase 1, the connection between San Francisco and Los Angeles/ Anaheim. This 520-mile connection can be accomplished in two ways:
>
> • Through a coordinated "blended system" that uses upgraded commuter rail systems to connect the metropolitan areas with the inter-regional high-speed system, and
>
> • By expanding fully dedicated high-speed infrastructure to San Francisco and Los Angeles/Anaheim. (*Id.*, p. 2-17.)

56-117 Despite the Authority's recognition of the blended system as "an additional phasing option for the urbanized sections that have existing commuter rail corridors" (p. 5-4), the PRDPEIR fails to treat the concept as a Project Alternative. The entire impact analysis is limited to this cursory statement: "...the blended system concept does not appear to distinguish among network alternatives." Failure to treat the blended system under *Laurel Heights II* as significant new information proposing a lower-impact project makes this PRDPEIR inadequate under CEQA. This treatment is inconsistent with the Draft Business Plan, which clearly contemplates a different approach to environmental review than was taken both in the current PRDPEIR and in the previous RFPEIR:

> This infrastructure will require some upgrades to accommodate high-speed operations and added capacity with speeds through urban areas of up to 125 miles per hour. However, such improvements can likely be accomplished while staying substantially within the existing rights-of-way,

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resulting in substantially reduced impacts to the communities along the corridor.

Based on this approach, **initial environmental reviews can focus primarily on the impacts of limited upgrades to the existing facilities, thus avoiding the mitigation requirements associated with an expanded dedicated high-speed system.** Sharing existing commuter rail facilities in urban areas will not only materially reduce the environmental impacts of the planned full system, but will result in substantial cost savings as well. Recognizing that the ultimate goal for the voter-approved program is fully operational high-speed rail service between the two end points included as Phase 1 of the system, **any expansion in the corridor to add additional capacity, accommodate dedicated tracks, significant structure or tunnel work, and additional right-of-way beyond what is defined in the blended system would have to be revisited through future environmental reviews**. Investigations show that the coordinated blended solutions as envisioned can accommodate service levels for many years into the future. (*Id.*, p. 2-18, emphasis added.)

This divergence in approach is captured in the proposal by Senator Simitian, Congresswoman Eshoo and Assemblyman Gordon (the SEG Plan, attachment 4), which should have been evaluated by this PRDPEIR as new information suggesting a lower-impact project alternative, but was not. That plan conveys grave concerns about the long-term impacts on the Peninsula of a certified EIR for the full buildout of the HST system, since such a system cannot be built within a reasonable period of time, and because such a high-capacity system might be unnecessary for the level of ridership expected. The SEG Plan noted the lower impacts of a blended system, and urged that the environmental review of the phased implementation of the full buildout of the system be stopped.

56-118

The on-going concern about the reliability of the RFPEIR's ridership numbers, as expressed by the Institute for Transportation Studies (SAR 9003), makes it unclear as to whether a full-build system is even needed in the foreseeable future. "These [very large error] bounds, which were not quantified by CS, may be large enough to include the possibility that the California HSR may achieve healthy profits and the possibility that it may incur significant revenue shortfalls." (SAR 9006.) It is clear that the blended system approach offers a much lower cost (p. 5-4), lower impact (p. 5-9) pathway forward--one that greatly reduces the project's risk. From the standpoint of the public funds at risk, it would be highly irresponsible to not study a blended system alternative.

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Commenters assert that the blended system, as described in the SEG Plan, and in accordance with the language of the Draft Business Plan, must be studied as a new

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alternative in a recirculation of the PRDPEIR. A blended system would mean an earlier project delivery, substantially lower costs and lower environmental impacts. It is conceptually distinct from a phased implementation of the full buildout project, in that urban areas would be excepted from the HST Engineering Criteria (FPEIR, p. 2-8) which require a fully grade-separated access-controlled right-of-way. This would be entirely consistent, however, with the shared-use corridor general criteria (FPEIR, p. 2-9), the project's Purpose (FPEIR, p. 1-4), as well as its Description:

> A fully grade-separated, access-controlled right-of-way would be constructed, except where the system would be able to share tracks at lower speeds with other compatible passenger rail services. Shared-track operations would use existing rail infrastructure in areas where construction of new separate HST facilities would not be feasible. Although shared service would reduce the flexibility and capacity of HST service because of the need to coordinate schedules, it would also result in fewer environmental impacts and a lower construction cost. (FPEIR, p. 2-2.)

Rather than merely delaying the impacts of a phased approach to building a four-track alignment (p. 5-9), a blended approach would eliminate those impacts for the foreseeable future. A 2011 Caltrain study concluded that a blended system is potentially feasible. (attachments 5 & 6.) The implementation of quiet zones should be added to the study of a blended system alternative, resulting in capturing most of the noise reduction benefits of a full-build alternative.

56-121

There is no analysis of the impact of blended operations on ridership, despite the obvious impact of transfers on waiting time and impedance. There is no analysis of the impact of either blended operations or phasing on the economic feasibility of the project. An EIR is required to consider and study a reasonable range of feasible alternatives, particularly alternatives that might significantly reduce project impacts. Given the much lower environmental impact of an Altamont Corridor Rail Project alternative, it is imperative that its ridership be assessed to determine if it constitutes an economically feasible alternative that should be considered and studied in depth, as the project cannot access Proposition 1A Bond funds unless it is projected to generate an operating profit.

56-122

<u>Deferred Ridership Impact Analysis</u>

The Court has already ruled that deferral of the study of impacts resulting from program-level decisions is not permitted under CEQA. The PRDPEIR impermissibly defers a full analysis of the phased implementation proposed in the Draft Business Plan until the project-level review:

> "The longer duration of construction and also lower ridership forecasts may result in differences in the environmental impacts and benefits as described in the 2008 Final Program

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EIR, the 2010 Revised Final Program EIR, and in this document. This discussion provides a qualitative, general assessment of these differences. The environmental consequences of phased implementation would be explored in more detail as part of second-tier, project level EIRs." (p. 5-4.)

The PRDPEIR's impact analyses have not been redone using the conservative ridership estimates published in the Draft Business Plan. The impact assessments, including the benefit assessments, may thus be quite overstated. While this does not necessarily violate CEQA, it does raise questions as to whether the balance of costs and benefits for a Phased Implementation approach fundamentally alters the desirability of this publicly funded project. This question must be answered at the program level.

56-123

Mitigation of Temporary Northern Altamont Terminus Station

The mitigations proposed for newly identified significant impacts on a temporary northern terminus for the Altamont route may be inadequate for a Union City terminus. BART trains have a maximum length, based on the size of station platforms. It is not possible to simply add more train cars, as suggested on p. 5-8. It is also questionable as to whether the BART system is able run more frequent service, given the headway limitations of its existing automation system. Instead of Union City, a Bay to Basin Altamont route would need to go all the way to Santa Clara or San Jose, where it could connect with the more flexible Caltrain system. This would be preferable for the passengers, as the largest number of them are traveling to Silicon Valley, and especially North San Jose. (2011 Altamont Corridor Rail Project Preliminary Alternatives Analysis, p. 2-6).

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Preferred Alternative

Especially if an Altamont Corridor Rail Project alternative is to be considered, the justification listed on p. 6-2 for choosing a Pacheco alignment can no longer be considered valid. One of the four stated criteria (Impacts on wetlands, waterbodies, and the environment) would clearly favor an Altamont Corridor Rail Project San Francisco/ San Jose alternative, which wouldn't have any major wetlands or waterbody impacts, unlike Pacheco. One of the criteria (Best utilizes the Caltrain Corridor) would equally favor either alternative. One of the criteria (Political support) is not an environmental criterion, and is neither relevant nor appropriate for selecting a preferred alternative based on feasibility and environmental factors. Indeed, the new Chair of the Authority's Board of Directors has publicly admitted[3] that the Authority's earlier choice of the Pacheco alignment based on political criteria was ill-advised. And there is evidence in the record (RFPEIR, p. 15-42) that the final criterion--the best connection between Northern and Southern California--favors an Altamont Corridor Rail Project alternative, as it would likely have 15.5% more annual riders. (see discussion, *supra*.)

[3] Statement made by Mr. Dan Richard during a presentation at the January 2012 Planning and Conservation League Annual Symposium.

56-124

A more appropriate selection process for a preferred alternative would be to compare how the alternatives meet "[f]urther objectives [are] to provide interfaces between the HST system and major commercial airports, mass transit, and the highway network and to relieve capacity constraints of the existing transportation system in a manner sensitive to and protective of the Bay Area to Central Valley region's and California's unique natural resources." (p. 6-11.) An Altamont Corridor Rail Project San Francisco/ San Jose alternative would have the following advantages:

1. It would pass through North San Jose, close enough for a shuttle to SJO.
2. It would pass near SFO, where it might be possible to connect it to the AirTrain.
3. It would offer a less costly and easier future connection to OAK and Oakland.
4. It relieves major interregional capacity constraints on I-80 and I-580.
5. It avoids the environmental impacts identified for other alternatives.
6. It would have significantly higher ridership and revenue.
7. It would serve both statewide and regional travel markets with one rail investment.
8. It could avoid the cost of a BART extension to Livermore.

56-125

PRDPEIR Section 6.2 fails to mention that each of the clarified and revised impacts has been identified not only as significant but also as unavoidable. The absence of any discussion of this very important change since the 2010 RFPEIR nullifies the statement that "These clarified and additional impacts along the Monterey Highway and in certain portions of the San Francisco Peninsula have been carefully considered in reevaluating the preferred alternative recommendation." (p. 6-3.) The selection of the Preferred Alternative must be conducted in the explicit context of the newly identified unavoidable impacts.

56-126

Conclusion

The PRDPEIR improperly fails to take into account significant new information that shows that there exists a previously-unstudied feasible alternative, using the Altamont Rail Corridor alignment, that would significantly reduce the impacts associated with the previously-chosen Pacheco Pass alignment. Under *Laurel Heights II*, CHSRA must study the Altamont Corridor Rail Project San Francisco/San Jose alternative and recirculate. CEQA requires the lead agency to select the project alternative with the fewest environmental impacts.

56-127

Commenters would like to see a successful HSR system in operation. They are convinced that the blended approach, coupled with an Altamont Corridor Rail Project San Francisco/San Jose alternative, would result in higher ridership, higher community support, lower cost, and faster delivery than the PRDPEIR's Preferred Alternative. They appreciate this opportunity to comment on this important document.

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Sincerely,

David Schonbrunn, President
Transportation Solutions Defense and Education Fund

Bruce Reznik, Executive Director
Planning and Conservation League

James R. Janz, President
Community Coalition on High-Speed Rail

Richard Tolmach, President
California Rail Foundation

cc: Stuart Flashman, Esq.

Attachments
Peer Review Group July Report
Peer Review Group August Report
Commenters' Scoping Comments
SEG Plan
Caltrain Capacity Analysis Update
Caltrain Draft Blended Operations Analysis

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012)

FINAL REPORT

Attachment 1

Independent Peer Review of the California High-Speed Rail Ridership and Revenue Forecasting Process

Findings and Recommendations from the January-March, 2011 Review Period

July 22, 2011

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

The California High Speed Rail Authority (HSRA) convened an independent peer review of the ridership and revenue forecasting process and outcomes. Reporting to the Executive Director, the Panel is charged with providing a comprehensive in-depth review of the models used to estimate ridership and revenue and the forecasts derived from them. The Panel held its first meeting at the Authority offices in Sacramento on Monday and Tuesday, January 10-11, 2011. This report summarizes the key issues, findings, and recommendations of the Panel.

The Panel consists of five members:

- Frank Koppelman, PhD, Professor Emeritus of Civil Engineering, Northwestern University (chair)
- Kay W. Axhausen, Dr.Ing., Professor, Institute for Transport Planning and Systems, ETH Zurich (Swiss Federal Institute of Technology Zurich)
- Billy Charlton, San Francisco County Transportation Authority
- Eric Miller, PhD, Professor, Department of Civil Engineering and Director, Cities Centre, University of Toronto
- Kenneth A. Small, PhD., Professor Emeritus, Department of Economics, University of California-Irvine

Rick Donnelly, PhD, AICP of Parsons Brinckerhoff served as facilitator and recorder of the meeting. In this capacity he serves at the convenience of the chair rather than as member of the project management consultant team.

The Panel has based their comments and recommendations upon a review of a large number of reports and information generated by Cambridge Systematics, Inc. (CS), the developers of the model, as well as resulting forecasts developed for the Authority. These reports are identified in the Appendix to this report. Several panelists also reviewed the recent critique of the model and forecasts by the Institute of Transportation Studies (Brownstone et al. 2010) and subsequent correspondence about it. That critique provided additional insight into the forecasts and the controversies surrounding them, but did not frame the Panel's deliberations.

The views expressed in this report are consensus findings reached through a high degree of agreement and common thinking among the panelists.

Overall the Panel was impressed with many aspects of the work on ridership and revenue forecasting completed to date on the project. The approach undertaken by CS was ambitious, it represented a significant improvement in practice in several respects (for example, through the development and linkage of a complex set of advanced models), and it demonstrated commendable openness. However, there are important technical deficiencies in the model and the documentation thereof. The purpose of this report is to provide a critical review of the models and associated forecasts, focusing on those aspects that are questionable or deserving of more work.

1 Charge to the Panel

Roelof van Ark, Executive Director of the Authority, opened the meeting by welcoming the Panel, introducing them to the project, and outlining his charge to its members. A relative newcomer to the project, his near-term priority is to strengthen the organization with top-notch, committed professionals. He is also committed to increased accountability and transparency in their work, including all aspects of the ridership and revenue forecasting. His goal is to address differences in a professional manner, using open and honest dialogue. This is one of four independent review panels serving the Authority. Like the others, this Panel will report directly to the Executive Director.

The Panel's work to date has looked at the system as a whole. Ultimately the Panel's reviews are expected to assist the Authority's need for technical support in completing an update to the business plan, and investment and risk analyses. It is the Panel's understanding that the model was not designed to support the analysis of the Minimal Operable Section (MOS) and associated detailed analyses. Mr. van Ark noted the controversy to date with the forecasts and underlying models, which in part motivated the formation of this Panel. However, the purpose of this Panel is not to further debate those controversies. Rather, the Authority is highly interested in the advice of this Panel about where to go next in their forecasting efforts, based upon the progress and capabilities to date. In addition to conducting more detailed analyses, the Authority requires the capability to assess public-private financing schemes and station area developments. It also desires to not waste taxpayer money on unnecessary and unproductive modeling and data collection.

2 Understanding of the current forecasting process

CS was hired by the Metropolitan Transportation Commission (MTC) in 2004 to develop a statewide multi-modal travel demand model to help evaluate alignments for segments of the high-speed rail (HSR) network. The model relied on trip tables and adapted mode choice models of existing travel demand models to forecast intra-regional travel in the two largest metropolitan areas to be served by HSR – namely, San Francisco (the MTC model) and Los Angeles (the SCAG model). In addition, a population-based estimate of intra-regional travel was used for forecasting HSR trips within San Diego. The intra-regional mode choice models are traditional nested logit models, with the top-level choice being that between motorized and non-motorized modes. HSR was added to the transit nest in each instance.

For inter-regional travel, a four step sequential model was developed that included trip frequency, destination choice, mode choice, and assignment components. The inter-regional mode choice model included a primary mode choice (car, rail, HSR, or air) and then a choice of access/egress modes. Trips by mode from the intra-regional and inter-regional models, along with intra-regional auto trips estimated from the Caltrans Statewide model, were aggregated prior to the assignment step.

The data used to estimate the inter-regional models was compiled from several sources. The main source was a stated preference survey that was conducted at airports, rail stations and by telephone from August to November of 2005. On-board surveys were conducted on the Altamont Commuter Express and the Metrolink trains in October and November of 2005. Telephone sur-

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veys of Amtrak passengers from the Capitol Corridor, the Pacific Sunliner, and the San Joaquin services were conducted during the same time frame. Air passenger surveys were done at six California airports (Sacramento, San Jose, San Francisco, Fresno, Oakland and San Diego) between August and November 2005. Unfortunately, surveying was not allowed at airports in the Los Angeles area. An effort was made to represent travel in and out of the LA area by over-sampling flights to these airports from surveyed airports. Finally, a random-digit-dialing telephone survey was conducted to capture auto trips in the San Diego, Los Angeles, Bakersfield, Tulare County, Fresno, Merced, San Francisco Bay Area, Modesto/Stockton, and Sacramento regions in August 2005. Overall, surveys from 3,172 respondents were collected during the study (1,234 air, 249 rail on-board, 181 rail telephone, and 1,508 auto).

The other primary data source for model development was the Caltrans Household Survey, conducted in 2000-2001. This was an activity-based survey that collected information from 17,040 households in all 58 counties in California. In addition, several surveys were used for model calibration (i.e., adjustment of various alternative-specific coefficients) to match known aggregate properties of travel patterns. For validation, checks of model predictions against additional known aggregate properties of travel patterns were evaluated. The main data sources for calibration and validation of the inter-regional models were the 1995 American Travel Survey, 2000 Census Transportation Planning Package, USDOT 10% air passenger ticket sample data for 2000, rail passenger data from California rail operators, Caltrans Household Survey, and traffic counts obtained from the Caltrans traffic count database. The intra-regional models were not calibrated and validated by CSI because they were assumed to have been calibrated and validated by the local agencies. The 2000 highway assignment validation results were summarized by facility type, area type, region and gateway. All highway summaries were reported to be within three percent of observed data.

The inter-regional model was finalized in February 2007. In 2008, the SCAG intra-regional models were refined, and in 2010 some changes were made to fix anomalies in the MTC models. During the same time, detailed travel forecasts under a no-build scenario (i.e., without HSR) were developed for 2030 using the model, and 2035 forecasts were developed by factoring up the 2030 results.

In addition, the model was used to analyze four main sets of scenarios including an HSR system as currently planned by the HSRA, either for Phase I or for the full system:

- Baseline assumptions plus various air and HSR fare structures and auto-operating costs; these resulted in figures used in the 2008 business plan;
- One of the fare structures analyzed in the initial set of scenarios (set 1 above) plus an 8% assumed increase in air and auto costs and a revised service plan;
- Assumptions of the second set of scenarios, but with an increase in the assumed parking costs at HSR stations;
- Assumptions of the third set of scenarios, but using the revised rather than original SCAG and MTC intra-regional models. This fourth set of assumptions was used in the EIR/EIS overall forecast of riders and revenue.

Overall the model responded reasonably, with ridership and revenue being affected by changes in fare price, parking costs and levels of service. All of the original model development and some of its early application were performed under the MTC contract, which was completed in September 2008. A small amount of model application work for the HSRA, contracted by the Parsons Transportation Group, was also completed in parallel with the MTC contract. CSI has served the HSRA since September 2008 through the program management contract held by PB Americas, Inc. During this time some model refinement was carried out, as well as further development and interpretation of forecasts.

3 Incomplete documentation

The Panel found several instances of incomplete or outdated information in the documentation, or could not locate such if it did exist. Two major areas were identified as key omissions that should be addressed quickly. It is expected that these information are readily available to the model developers, or can be quickly summarized from their work completed to date.

3.1 Inputs to model application

The assumptions about, data development, and summaries of several key inputs to the model should be documented. We could find little or no discussion of these inputs and their underlying assumptions:

- Fare levels or structure
- Levels of highway and airport congestion
- Levels of service (train frequency)
- Levels of ridership and service on competing intercity bus services
- Fuel prices (sensitivity tests on auto operating cost assumptions are advised)
- Induced effects
- Competitive responses from other modes (sensitivity tests of both reduced fares and varied levels of service). These include especially the airline industry, but also “curbside” express intercity bus services that have grown rapidly in the last decade in the Eastern and Midwestern United States.
- Socioeconomic and land use forecast inputs

The level of service topic is particularly important to tie to operating and business assumptions made by the Authority, and should be attributed as such. For example, the frequencies in San Francisco (8 million residents) in full build-out of 12 trains per hour are comparable to Tokyo, with 30 million residents). The Panel questioned whether such assumptions are realistic, and what the effect of lower levels of service (decreased frequency) on ridership would be. These issues should be clearly addressed in the documentation.

3.2 Validation and documentation

There appeared to be considerable confusion between estimation, calibration, and validation in the documentation. While this is not unique to these reports, we feel that the following definitions are widely accepted and should be used in both the revision of current documentation and in all future work:

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- *Model estimation* is the inference of model form and parameters from survey data and the related statistical testing of those parameters as well as of alternative model formulations (i.e. specifications).
- *Model calibration* is the adjustment of the completed model system, mainly through changes in alternative-specific constants, so that its predictions match specific targets generated from observed data (including the data used in estimation).
- *Model validation* is the testing, and perhaps further adjustment, of the model system using data other than (and usually newer than) the data from which it was estimated.

There is no evidence that model validation defined in this manner was carried out. Rather, elements of the model were estimated using travel survey data collected in 2005. The resulting model was calibrated to observed data from the year 2000. Moreover, the targets used in calibration appear to reflect essentially the same information as that used in estimation.

A more thorough descriptive analysis and interpretation of the data used to build the model would have been helpful for our analyses. Some of the analyses needed before the Panel can complete our review of the current model include:

For the calibration year only

- Maps, graphs, and tabular summaries of statistical measures of the deviation between assignment results and observed modal flows (road, air, rail)
- Tabular summaries of comparison of assigned versus observed screen line volumes

For both calibration and forecast years

- Overall mode shares by origin-destination distance
- Mode shares by income
- Tables and maps of long distance trips per day by person type (income, region of residence, etc.) and trip purpose
- Summary of income elasticities by mode

For forecast years only

- Mode shares by network distance from HSR stations (distinguished among HSR stations with different access modes)
- Tables of own- and cross-elasticities by mode for the time and cost variables across the state, by origin-destination distance or inter-regional pairs, by income group and distance band from the HSR stations
- A brief assessment of access and egress mode shares (and parking demand in particular) detailed appropriately by HSR station
- Analysis of the effects on forecasts of expert judgments that were made to override estimated model coefficients

As a further check on model validity, it would be useful to compare key results with what has been observed in other systems, as discussed earlier. Such external comparisons have the advantage of implicitly incorporating various practical considerations that cannot easily be included in a mathematical model. These include operational problems, cutbacks due to inadequate funding, unanticipated responses of competitive suppliers, and feedback effects from a project on

local employment. Flyvbjerg et al. (2007) suggest a somewhat formal process for such comparisons called reference class forecasting that is commended for consideration. A similar but less formal approach would be to identify a few relevant case studies for comparison. In either case, when results differ, much can be learned from examining the reasons. The hope here is to avoid the types of systematic over-estimates of demand that Flyvbjerg et al. identified in other large rail projects around the world.

Yet another check would be to compare the assumed characteristics of air service with what has developed in other places when HSR service is introduced. The model assumes a rather passive response by air carriers, but the history of U.S. air deregulation suggests that air carriers in fact react strongly to changes in their competitive environment. Evidence from other places where HSR has been introduced, as well as from the extensive theoretical and empirical literature on the airline industry, will help assess the likelihood of drastic changes in air carrier pricing and service. Such changes might include price wars on the one hand or complete abandonment of the market by airlines on the other. Either outcome could have drastic impacts on HSR ridership and revenue. The research literature has begun to develop models specifically designed to analyze how the airline industry would respond to the introduction of HSR services (e.g., Adler et al. 2010).

4 Short term issues

The Panel has significant concerns about the model formulation, primarily with respect to specification that should have been addressed during previous work. Pending improvements to the model, we recommend that any use of the model include some steps to make the demand forecasts more conservative, especially in forecasts for financial (investment and risk) analysis.

4.1 Representation of distance in destination and mode choice models

The current model classifies travel further than 100 miles as long distance trips. This demarcation seems reasonable, especially given that a similar definition was used in the 1995 American Traveler Survey, which was an important source of such information at the time this model was developed. The choice of an ultimately arbitrary division of the travel market into two distance segments, however well justified, might lead to discontinuities between them. The CSI models report should show explicitly that this is not a problem. Otherwise, CSI should consider joint models in which distance is entered in a non-linear manner (e.g., a Box-Cox transformation) and as part of suitable interaction terms. Such non-linear formulations are moderately more difficult to estimate, but can be estimated using several off-the-shelf software packages and common languages including Biogeme, ALOGIT, and Gauss.

A second issue of concern to the Panel is the non-monotonic nature of the cubic functions of distance specified for some trip purposes. We recommend that a Box-Cox transform be adopted to ensure that the distance function is monotonic. This would reduce the number of estimated parameters by one, and it appears it would make only a small difference in goodness of fit based upon our inspection of the estimated curves.

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4.2 Observed heterogeneity

Observed heterogeneity in the mode choice models was apparently not investigated with respect to trip-makers' preferences for specific modes or differential sensitivity to different level of service measures. These and other interaction terms that might normally be expected in such models are missing in this one. Interactions between socioeconomic variables (income, etc.) and time/cost variables should be included in the model. The effect of such variables is to account for heterogeneity in traveler response (i.e., for variation across the population of travelers in how various service characteristics are evaluated). Such heterogeneity has been found in virtually every study that has looked for it, and in some cases detailed results turn out quite different when it is included. The Panel found no evidence that these results are biased in aggregate or that any differences are in a particular direction as a consequence, but believes it is a relatively simple improvement that will make the model more reliable. This is also a near-term high priority item.

4.3 Inadequate exploration of level of service variables

The Panel found no evidence that alternative representations of level of service variables were investigated, which is important to obtaining a good behavioral representation and sensitivity to changes in service. Examples of such alternative specifications include:

- Replacing the simple headway variable by its inverse (frequency of service) or some other non-linear transformation;
- Dividing the cost variable by some function of income, in order to represent the well-established tendency of higher income travelers to exhibit less sensitivity to cost; and
- Dividing out-of-vehicle time by some function of overall travel distance, in order to represent the reduced importance of out-of-vehicle time with increasing trip length.

It is essential that the model be appropriately sensitive, as one of the chief causes of over-optimistic demand forecasts in other studies has been that financial constraints may lead to less frequent service or lower speeds than planned. At a minimum, this sensitivity analysis should include documenting the effect of varying levels of service on the resulting forecasts.

4.4 Inadequate justification of constraint on out-of-vehicle travel time

The Panel felt that the constraint imposed on out-of-vehicle travel time in the main mode choice model was unjustified. The rationale for asserting a substantially different value was understood to revolve around the difficulties of calibrating the final model, and the fact that the asserted value (1.0) is roughly consistent with assumptions that (a) out-of-vehicle time equals one-half the headway and (b) out-of-vehicle time is valued twice as much as in-vehicle time. The Panel feels that these two assumptions are valid only for urban trips with small headways, and thus do not justify changing an empirically estimated value – especially because the estimated value is consistent with other results for intercity markets where behavior is much different from an urban market. Specifically, Adler et al. (2005) found that headway for an intercity trip is valued at 0.2 to 0.25 as much as in-vehicle travel time; this result is further supported by unpublished values found by PB in their statewide modeling work. Furthermore, the Panel suspects that difficulties in calibration might have been influenced by under-specification of the choice models as discussed in section 2.3 above.

We want to highlight that the headway variable captures the impact of the schedule delay (the difference, early or late, between desired and scheduled departure time, and not of any initial waiting time at first boarding. The initial waiting time has been shown to be the choice of the traveler reflecting their risk preference with respect to access time, time needed at the station or the stop. If needed, the model should include a variable to capture the waiting times at any transfer, as these are outside of the control of the traveler.

4.5 Excessive use of alternative-specific constants

The destination and mode choice models at both the intra-regional and inter-regional levels have a surprisingly large number of constants. While difficult to independently assess, it would appear that these constants exerted a significant influence on the forecasts, which the Panel feels is an undesirable property of the model. We believe this may be a symptom of an under-specified or mis-specified model as discussed in the above sections (i.e., a model with an inadequate set of observable variables explaining behavior or with an important parameter constrained inappropriately). It is hoped that addressing the issues identified in previous sections will reduce the need for such constants.

5 Long term issues

Several important issues were identified that should be considered to enhance the improved model to provide the best possible estimates of HSR ridership. While not practical to address all of these issues immediately, the Panel believes that their consideration will measurably enhance the utility and credibility of the model and forecasts obtained using it. As per Section 4, pending improvements to the model, we recommend that any use of the model include some steps to make the demand forecasts more conservative, especially in forecasts for financial (investment and risk) analysis.

5.1 Model validation

Apparent omissions in model validation concerned the Panel. It was strongly felt that a number of checks on the reasonability and validity of the model should have been carried out and documented, to include:

- Comparisons to other observations and forecasts in California developed from data sets that are different from those used in this model (e.g., California statewide model, 2001 NHTS);
- Comparisons of forecasted ridership to actual ridership on HSR systems in other parts of the world;[1]
- Sensitivity testing of the importance of assumed HSR levels of service and of alternate assumptions about highway and airport congestion;
- Sensitivity testing of the effects of alternate levels of socioeconomic variables used in forecasting, using independent estimates of growth from sources such as Global Insight,

[1] It is recognized that such comparisons are difficult because no comparable service exists within the USA, and several important traveler and social differences exists between North Americas, Europeans, and Asians. However, it is felt that these differences should at least be tabulated and discussed.

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the Federal Reserve Bank of San Francisco, Bureau of Business and Economic Research, and published U.S. Department of Commerce and Census trends;
- Sensitivity testing of assumptions about parking availability at planned HSR stations.

Some of these comparisons may of necessity be more qualitative than the more familiar statistical tests of model performance, but they are essential when modeling non-existent major new transportation modes or services like HSR.

5.2 Stated preference (SP) bias

Another major concern to the Panel is the potential influence of bias introduced by the use of stated preference (SP) survey data in model development. Respondents have been observed in many SP surveys to exhibit various systematic biases concerning their responses to hypothetical options. These biases depend greatly on the details of the survey, as well as the local environment of the respondents themselves. The research community has developed many guidelines to minimize such bias, and this needs to be fully discussed in the validation of the model. It is especially important in this case, because HSR mode share in the "main mode" choice model is determined solely by the SP responses. Thus, if respondents systematically overstate or understate their willingness to ride HSR (perhaps because they support it or oppose it as a concept) the resulting bias will be carried over directly into the HSR ridership forecasts.

We can suggest two ways to address SP bias:

- Examine other studies in the United States where there is more opportunity for internal validation though a combination of SP and revealed preference (RP) survey questions. Where HSR exists, it would be possible to question respondents about both their actual (RP) mode choices and their responses to hypothetical changes in the system (SP). Techniques are available to compare the two in order to illuminate systematic differences. This methodology is well developed in the research literature. Even where true HSR does not exist, a "near HSR" service – such as Amtrak's Acela service in the Northeast Corridor – would generate useful comparison data. The Panel recommends a search for existing combined RP/SP data sets. If found, an assessment of SP survey bias and a comparison of survey questions and methods with those used by CSI should be undertaken to learn as much as possible about whether such bias might affect the SP data used in the California HSR ridership forecasts. Even studies from abroad can be used for this purpose, despite their limitations for direct comparison of model results due to differences in urban development patterns, urban transit systems, and socio-demographics.
- It is possible to consider HSR as a drastic improvement to existing conventional rail service. California has two of the most well used conventional rail corridors in the United States (Los Angeles-San Diego and San Francisco-Sacramento). It is possible to perform a combined RP/SP survey in these corridors, where respondents are asked both about their use of existing conventional rail and about their hypothetical use of improved service, including both minor and major increases in speed. This will permit a direct investigation of SP bias in California data. Such an investigation is highly recommended as part of any enhancement of this model, as further elaborated in section 6 below.

6 Econometric issues

The survey designed and conducted for CSI included the use of Choice Based Sampling. That is, the sample was biased both for administrative purposes and to ensure that a minimum number of respondents were found to choose each of the major modes (both existing and proposed). The use of a choice based sample is known to bias estimation results unless the estimation procedure is modified to take account of this sampling. The method used by CSI, which was believed to be correct at the time of model estimation, has since been shown to be incorrect and a new procedure has been developed which is correct (Bierlaire et al. 2007). Future estimation work should take advantage of this new knowledge.

7 Data requirements for model enhancement

CSI has presented the Authority with a proposed work plan to continue the evolution of the forecasting process and the underlying models. The Panel focused primarily on the current models and forecasts in this first meeting, which precluded a careful and thorough review of this proposal. However, it was clear even from a cursory review that further data collection will be required for the evolution of the models, even if they are not made available for the re-estimation of the models implied above.

Two tasks – 16 and 17, presumably additions to previous work – are identified in the proposal. Task 16 includes plans for data collection to assist with updating the models, both to refine the existing model as well as support re-estimation of the enhanced model. The Panel supports this proposal. In fact, it is recommended that the data collected be expanded beyond that described in the proposal.

Several panelists advanced the notion that a combined RP/SP survey would be useful, especially if well designed to illuminate the SP response bias in the California context. It obviously cannot be measured for the HSR mode, as it does not presently exist, but would allow its measurement for other modes. Targeted sampling in heavily used conventional rail corridors in the state (i.e., San Diego-Los Angeles, San Francisco-Sacramento) is recommended as a means of conducting SP experiments in an environment as close to HSR as possible. This would allow the direct comparison of SP to RP coefficients, a key to quantifying the effect of respondent bias. Several successful protocols are available to help with design, such as the PAPI or CATI-KITE surveys (Frei et al. 2010).

In order to be useful for model estimation, and especially within the context of the recommendations contained herein, the RP data should include information about several aspects of the long distance trip, to include:

- Primary mode of transport
- Modes of access and egress
- Station choice
- Destination and group (party) size
- Trip frequency and primary purpose

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The use of an eight-week retrospective survey of long distance travel is highly recommended. Such an approach will yield a substantially larger amount of data on such trips than the traditional 24 or 48-hour diaries typically used in household travel surveys.

The Panel has learned that plans for the design of a new statewide travel survey are underway, and perhaps complete. It is highly recommended that the Authority quickly determine the status of such efforts and opportunities for collaboration. The ability to share costs, eliminate duplication of effort, and ensure consistency with other California models should not be lost.

8 Conclusions

The current model system represents an ambitious step towards defining the best practice in North America, replacing ad hoc and closed proprietary models used in many previous HSR feasibility studies. In many ways the model is generally well founded and implemented. However, in order to have full confidence in it the issues identified in Section 4 must be addressed quickly. Moreover, the incomplete, unclear, or out-of-date elements of the documentation discussed in Section 3 must be completed as part of the short-term actions. Once these issues are addressed the Panel will be in a position to make a more definitive determination about the model and forecasts derived from it.

References

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Bierlaire, M., Bolduc, D. & McFadden, D. (2008), "The estimation of generalized extreme value models from choice-based samples", *Transportation Research Part B*, 42(4), 381-394.

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Flyvbjerg, B., Holm, M.K.S. & Buhl, S.L. (2006), "Inaccuracies in travel forecasts", *Transport Reviews*, 26(1), 1-24.

Frei, A., Kuhnimhof, T. & Axhausen, K.W. (2010), "Long distance travel in Europe today: experiences with a new survey," unpublished presentation at the 89th Annual Meeting of the Transportation Research Board, Washington, D.C., January.

Appendix: Materials Consulted

Cambridge Systematics prepared all documents listed unless otherwise indicated.

2005-07 model development and results

- 2010 Project Level EIR/EIS Technical Appendix (prepared by Parsons Brinckerhoff) Ridership and Revenue (Draft), December 2010
- Report to the Legislature (Business Plan) (prepared by the California High-Speed Rail Authority)
  Source Document 5: Ridership and Revenue Forecasts (by PB), November 7, 2008
- Bay Area/California High-Speed Rail Ridership and Forecasting Study
  - Findings from Third Peer Review Panel Meeting, September 2007
  - Ridership and Revenue Forecasts, August 2007
  - Statewide Model Networks, August 2007
  - Final Report, July 2010
  - Statewide Model Validation, July 2007
  - Interregional Model System Development, August 2006
  - Level-of-Service Assumptions and Forecast Alternatives, August 2006
  - Findings from Second Peer Review Panel Meeting, July 2006
  - Socioeconomic Data, Transportation Supply & Base Year Travel Patterns Data, December 2005
  - Findings from First Peer Review Panel Meeting, July 2005
  - Model Design, Data Collection and Performance Measures, May 2005
- High Speed Rail Study Survey Documentation, December 2005 (Corey, Canapary & Galanis Research)

2008-10 Technical Reports and Forecasts

- Ridership and Revenue Results
  - Revised Service Plan May 2009, August 14, 2009
  - Hanford/Visalia, March 16, 2010
  - Alternative Alignment Between Gilroy and Merced, March 8, 2010
  - Split SF Terminal Operations Scenario and New Caltrain Operating Plan, August 17,
  - 2010
  - Inland Empire Alignment and Station Alternatives, August 17, 2010
  - Alternative Station Configurations in San Diego County, August 17, 2010
  - Alternative Station Locations in the San Fernando Valley, August 17, 2010
  - Anaheim 3 Trains Per Hour Scenario, August 17, 2010
  - San Gabriel Valley Alignment and Station Location Alternatives, August 17, 2010
  - Increased Parking Cost Scenario and Revised 2035 Factoring Process, January 14,
  - 2010
  - Increased Parking Cost Scenario, March 9, 2010
- Ridership and Revenue Forecasting for the Finance Plan, October 2008
- Refinement and Recalibration of the MTC Intraregional Model, March 2010

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FINAL REPORT

Attachment 2

Independent Peer Review of the California High-Speed Rail Ridership and Revenue Forecasting Process

Findings and Recommendations from April-July 2011 Review Period

August 1, 2011

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

1 Introduction

The peer review panel held its second formal meeting on May 2-3 at the offices of the San Francisco County Transportation Authority. All members were present except for the recorder, who attended via videoconferencing:

- Frank S. Koppelman, PhD, Professor Emeritus of Civil Engineering, Northwestern University (chair)
- Kay W. Axhausen, Dr.Ing., Professor, Institute for Transport Planning and Systems, ETH Zurich (Swiss Federal Institute of Technology Zurich)
- Billy Charlton, San Francisco County Transportation Authority
- Eric Miller, PhD, Professor, Department of Civil Engineering and Director, Cities Centre, University of Toronto
- Kenneth A. Small, PhD, Professor Emeritus, Department of Economics, University of California-Irvine

Rick Donnelly, PhD, AICP of Parsons Brinckerhoff served as facilitator and recorder for the panel. In this capacity he serves at the convenience of the chair rather than as a representative of the project management team.

The panel invited several others to attend some portions of the meeting. They included Nick Brand from Parsons Brinckerhoff (representing the project management team) and Jeff Buxbaum, David Kurth, and Kimon Proussaloglou from Cambridge Systematics (CS). During the meeting the following broad topics were discussed:

- Briefing on ridership forecasting milestones in the near future (all in attendance)
- Discussion of the proposed Cambridge Systematics work plan for model enhancements (all in attendance)
- Review of CS responses to issues of concern identified in previous peer review panel findings (closed meeting among panelists)
- Discussion of panel assessment of CS responses (all in attendance)
- Identification of topics for further discussion and wrap-up (all in attendance)

Several topics discussed in the meeting were left unresolved, pending further investigation by the CS team. In such instances one or more panelists identified issues or questions during the meeting that could not be answered without further research or model summaries. The panel subsequently met with the CS staff identified above in videoconferences on May 27th and June 14th, 2011 to receive and discuss their responses. This report documents the findings over the panel from all three meetings, as well as teleconferences and email exchanges during that time.

2 Review of Supplemental Documentation

We identified two areas of concern about documentation in Section 3 of our first report. In some instances documentation was incomplete or missing. In other cases key information needed to interpret previous model validation work was not found. CS resolved both issues over the past three months. In addition, CS has re-validated the current model using more recent socioeconomic, travel survey, and traffic count data. The review of this newer data has largely alleviated our concerns with previous gaps of documentation on this subject.

2.1 Documentation Addenda

Following our initial meeting in January, we identified a number of missing, incomplete, or confusing aspects in the documentation. There was no evidence that these issues pointed to problems with the model, but rather that a thorough review of the model could not be completed without this additional information. CS developed a 43-page memo (Cambridge Systematics 2011) summarizing their responses to the information we requested, shown in Table 1. While their responses were limited to information about inter-regional travel[1], we felt that this was highly responsive to their needs, and permitted us to make well-informed impressions of the current model.

Table 1: Incomplete documentation identified in first peer review panel report

Further information about inputs to model application were sought in the following areas:

- Fare levels and structures
- Levels of highway and airport congestion
- Levels of service (train frequency)
- Levels of ridership and service on competing intercity bus services
- Fuel prices
- Induced effects
- Competitive responses from other modes
- Socioeconomic and land use forecast inputs

Further documentation of the model validation results were sought, to include:

For the calibration year only

- Maps, graphs, and tabular summaries of statistical measures of the deviation between assignment results and observed modal flows (road, air, rail)
- Tabular summaries of comparisons of assigned versus screenline volumes

For both calibration and forecast years

- Overall mode shares by origin-destination distance
- Mode shares by income
- Tables and maps of long distance trips per day by person type and trip purpose
- Summary of income elasticities by mode

For forecast years only

- Mode shares by network distance from HSR stations
- Tables of own- and cross-elasticities by model for the time and cost variables across the state, by OD distance or intra-regional pairs, by income group and distance band from HSR stations
- A brief assessment of access and egress mode shares by HSR station
- Analysis of the effects of forecasts of expert judgments that were made to override estimated model coefficients

[1] As part of their model design CS defined regions of the state that are aggregations of counties. Inter-regional trips are those with trip ends in different regions, irrespective of the distance traveled, while intra-regional trips have both trip ends within the same region. A map of the regions can be found in Cambridge Systematics (2006).

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We reviewed this memo and its predecessors in great detail, and several hours were spent discussing the information presented. We were very pleased with content, quality, and quantity of the information. Only a few items left us with lingering concerns. We continue to struggle with the arbitrary distinction between intra-regional and inter-regional trips, although we understand the practical rationale for it. We would like a more clearly defined demarcation of geographic travel segments in future work, if the distinction is maintained at all.

We have been concerned about the possibility of discontinuity in mode choice at the 100-mile demarcation between local (less than 100 miles) and long-distance (greater than or equal to 100 mile) travel markets. CS presented evidence that indeed such a discontinuity does occur, but the effect was shown to be small. If the long versus short distance segmentation is retained in the model structure, clear and conclusive evidence should be produced to demonstrate that any remaining discontinuity is small enough to have little to no impact on model forecasts. CS is currently undertaking an exploration of the effect of combining the long and short distance models into a single model that takes account of distance in the model specification. The initial results of such work will be presented to the panel at the planned August 10th and 11th meeting.

We also noted that the reported elasticities for total auto trips with respect to auto travel times have unexpected signs in Table 12 of the CS memo (Cambridge Systematics 2011, but also that they were very small in magnitude and not statistically significant. The panel believes that this anomaly is of negligible importance and is adequately explained by location-specific differences in trip generation effects (as suggested in the CS memo), and is therefore satisfied that no further action is needed with respect to this particular finding.

We are satisfied with the documentation presented in Cambridge Systematics (2011), and conclude that it demonstrates that the model produces results that are reasonable and within expected ranges for the current environmental planning and Business Plan applications of the model.

The longer-term issues mentioned in Section 5 of our report from January, 2011 remain unaddressed. We continue to view these as critical to a full assessment of the credibility of model forecasts for future applications. These were examined in the panel's August meeting and our conclusions will be reported shortly.

2.2 Expanded Validation Efforts

This section considers the work being done by CS to validate and, if necessary, adjust the model to reflect changes in socioeconomic conditions and travel patterns since the years 2000 and 2005, which were the sources of the data used in model development. CS has developed a proposed work plan for enhancement of the current model to address expected future needs of the Agency and our recommendations. We reviewed their fourth draft of the proposal, dated April 20, 2011, in preparation for the May 2-3 meeting. We discussed the proposal at length, and compared it to both the short and long-term recommendations they made after their January, 2011 meeting.

Jeff Buxbaum of CS summarized the anticipated uses of the current model. Owing to the business plan deadline the CS team plans several short-term actions:

- Collection of data for re-validating the model to observed 2008-09 flows. This was scheduled for completion in May and June.
- Changes to the model based on the re-validation work, schedule for completion in June, resulting in an interim model to be used until the next generation model is complete.
- Continued to work on ridership and revenue forecasting with the existing model to evaluate different configurations of initial operating segments (IOS), Phase 1, and the full system, scheduled for completion in July.

In parallel to these efforts, CS staff is also planning to carry out enhancements that will be incorporated into the interim model after the business plan forecasts are complete. These enhancements are discussed in Section 4. We discussed the relationship between the current, interim, and possibly a model to be developed in the future, both during the May 2nd meeting and in subsequent internal discussions. We emphasized that any model development work beyond that needed for the IOS and 2011 business plan should be directed towards addressing the long-term issues previously identified in addition to meeting the schedules and capabilities required by the Authority. How exactly that can be done was discussed at length, as summarized in the remainder of this section.

Two important inputs identified for the re-validation work were analyses of the 10 percent sample of air passenger tickets and an Internet panel survey of long distance journeys. The former is being processed by Geoffrey Gosling as part of his work, while the latter will be performed by Harris Interactive to specifications developed by the CS team.

CS plans to use the Harris Interactive data to learn more about long distance journeys in relation to traveler and household attributes (e.g., income, household size, number of workers, auto availability). Harris has a pre-selected and verified a panel of respondents, from which they can deliver responses for a wide variety of desired sample frames. We discussed the representativeness of a pre-selected panel for intercity travel market analysis. While a specially-drawn random sample might in principle offer advantages, time and budget constraints precluded this possibility and the use of the Harris poll clearly represents the most cost-effective way to quickly obtain data needed for short-term improvements to the model.

Two other sources of data – retrospective travel surveys and an upcoming California Department of Transportation (Caltrans) statewide travel survey – represent other possible sources of information to support model development. Again, undertaking a retrospective survey simply is not feasible within the scope of the current work, while the Authority does not appear to be able to influence the design, sampling frame, or other details of the Caltrans survey. While the Harris poll data will provide very useful immediate input to the model upgrade, comparison to the results of the Caltrans statewide travel survey, as soon as it becomes available, will provide additional useful information for the modeling work as well as an additional check on the Harris poll results.

Other potential sources of travel behavior data discussed included the 2009 National Household Travel Survey (NHTS) and Amtrak passenger surveys. The number of intercity trips in the NHTS is very small, greatly reducing its utility for use in this work. California was not one of the states that purchased additional sampling to increase the number of observations using rural and intercity travel. Amtrak historically has not shared data, but CS agreed to renew attempts to identify and obtain relevant data from them. The panel felt that this information would be particularly

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useful for the analysis of IOS alternatives in the Central Valley, where Amtrak will be a larger competitor to HSR than air service.
The CS team is also planning to adopt the networks and zone system being used by the statewide travel model under development by the University of California at Davis (UCD). The zone systems of that and the current model are slightly different, but this is not expected to create significant difficulties.

Furthermore, 2030 socioeconomic forecasts are not yet available for the UCD zone system. Jeff Buxbaum reported that new economic data from economy.com will be purchased as a placeholder until an independent economist can be contracted to provide an alternative to the forecasts presently used. We endorses this approach, believing that the testing of alternative economic futures will enhance the credibility of the model with policy-makers and potential investors and enable them to better gauge the risk associated with such assumptions in the forecasts.

3 Short-Term Issues Resolved

We found that significant progress has been made in the resolution of many short-term issues identified in Section 4 of our January 2011 report.

3.1 Representation of Distance Effects in the Model

In Section 4.1 of our first report, we expressed concern about the representation of distance in the destination and mode choice models. In response to our comments, CS conducted tests demonstrating that the discontinuity between the short and long-distance models at 100 miles is present but not quantitatively significant. The evidence from their testing suggests that the number of trips affected is very small, leading us to conclude that further work on this issue – which would likely take the form of joint models of short and long-distance travel – can be deferred and dealt with as part of developing an updated version of the model.

3.2 Observed Heterogeneity

In Section 4.2 of our first report, we outlined concerns that observed heterogeneity was not adequately treated in the current model. At the time, we found no evidence that the forecast results were biased in aggregate, but that an improvement in this area (i.e., characterizing some parameters as functions of distance or household characteristics) was a candidate for quick resolution. CS conducted exploratory estimations of alternative mode choice models that explored the influence of income and its interaction with other variables. This led us to conclude that the effects were significant, which is in line with typical findings from both urban and statewide models, and should be included in an enhanced model structure when possible. However, we found no evidence that the current treatment of income biases model results toward more or less optimistic forecasts.

3.3 Examination of Level-of-Service Variables

In Section 4.3 of our first report we criticized the lack of sensitivity testing of key service variables. CS conducted a large number of sensitivity tests over the past few months that are documented in Cambridge Systematics (2011). We are satisfied that the model is appropriately sensitive across the range of values tested, leading us to conclude that this issue has largely been resolved, apart from station access.

3.4 Constraint on HSR Vehicle Headways

In Section 4.4 we expressed concern with the original model's constraining of the coefficient on headway to equal that of travel time, for the HSR mode. This was in response to several problems, as described in the original CS final report (Cambridge Systematics 2006) and the Authority's response on this issue (CHSRA 2010). We continue to believe that a better solution would have been to fully re-estimate the model in ways described in our first report. However, the schedule for producing the 2011 business plan and other deadlines beyond the control of the Authority precluded delaying the project for the four to six months that such work would have required. We also recognize that a viable model sometimes needs professional judgment to overrule statistically estimated parameters, and any of us might also have made such a decision in similar circumstances.

We have examined in detail the question of how the model performs with respect to headway. It is important to note that the portion of waiting time that is independent of headway (e.g. walking time from a station entrance to a platform) is presumed to be included in the mode-specific constants of the model. Thus, the constrained coefficient truly reflects only the effect of headway in mode choice, and cannot be expected to equal the ratio of out-of-vehicle to in-vehicle travel times.

CS calculated the elasticity of total HSR ridership with respect to HSR headway at approximately -0.30 (see last two rows of Table 14 in Cambridge Systematics (2011). This elasticity is about the same size that the panel would expect, based on experience with urban transit and accounting for the expectation that headway is likely to be less important in intercity than in urban transit. It also compares well to elasticities found in a national survey in Switzerland, covering trips 10-300 km in length, whose values are shown in Table 2. Furthermore, the panel feels that if the original model had kept the estimated coefficient (which was approximately one-

Table 2: Swiss elasticities for long distance travel (Source: Vrtic & Axhausen 2003)

Demand elasticities shown for distances greater than 10 kilometers
(SP parameters at the mean values of the underlying RP trips)

Parameter(s)	Mode	All	Commute	Business	Shopping	Leisure/ Vacation
Travel time car	Car	-0.425	-0.665	-0.68	-0.545	-0.53
	Train/transit	0.671	0.776	1.531	1.008	0.937
Cost car	Car	-0.121	-0.312	-0.076	-0.156	-0.174
	Train/transit	0.191	0.365	0.171	0.288	0.308
In-vehicle-time train/transit	Car	0.365	0.48	0.615	0.46	0.456
	Train/transit	-0.575	-0.56	-1.386	-0.85	-0.805
Fare train/transit	Car	0.157	0.435	0.092	0.223	0.217
	Train/transit	-0.247	-0.508	-0.206	-0.512	-0.373
Access/egress train/transit	Car	0.172	0.272	0.111	0.279	0.127
	Train/transit	-0.272	-0.318	-0.249	-0.515	-0.224
Headway	Car	0.144	0.32	0.154	0.121	0.116
	Train/transit	-0.277	-0.374	-0.346	-0.224	-0.205
Number of travelers	Car	0.115	0.133	0.151	0.101	0.134
	Train/transit	-0.181	-0.156	-0.339	-0.186	-0.237

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fifth as large as the value they constrained it to), the resulting elasticity would have been too low to be plausible. Therefore, we conclude that in the end, this problem with the model did not misrepresent traveler behavior in important ways.

3.5 Excessive Use of Constants

In Section 4.5 of our first report we criticized the excessive use of alternative-specific constants. The fear was that this would cause the model to be unrealistically unresponsive to changes, or to display paradoxical responses to changes in conditions. The extensive documentation provided to us by CS, in response to our first report, does not reveal such unrealism or paradoxical behavior. Therefore, this originally perceived problem with the model does not seem to be adversely affecting its behavior. In particular, we now think that the magnitude of alternative specific constants is neither an indication of poor model fit nor of inadequate representation of the impact of operational or travelers variables on behavior. That said, we still believe that every effort should be made to eliminate the use of such a large set of constants in future versions of the model. They represent current travel patterns that may not hold true under future conditions.

4 Initial Investigations into Mode Choice Model Improvements

In parallel with addressing the short-term issues described above, CS invested considerable effort exploring alternative mode choice model formulations, both to inform future model development work and to investigate the robustness of their current model to changes in specification. The bulk of this work has focused upon the re-estimation of the line haul mode choice models. We anticipate that this work will be incorporated into a new version of the modeling system that will be available for use sometime in 2012.

4.1 Long Distance Mode Choice Model for Business Trips

The panel previously expressed reservations about the omission of income from the current line haul mode choice model. Several model formulations designed to incorporate this effect and others were presented, all with encouraging estimation results. The panel offered several observations and interpretations of the findings, all of which were agreed with by CS:

- The model was tested using both three and seven groupings of income. The panel agreed that three income levels, as suggested by CS, appeared to perform as well as seven, and this smaller number of categories is easier to forecast and implement. These income categories, plus one for missing income information, substantially improve the model and give sensible results when interacted with the cost variable. We maintain our longer-term recommendation that estimation of imputed income be undertaken to (1) obtain continuous values of household income to replace the current categorical variables, and (2) provide income estimates for households for which no income response was given.
- With respect to mode-specific dummy variables for income categories, it appears that interacting cost and performance variables with all income categories would be over-fitting. We recommend retaining only the high-income category for this purpose. We continue to recommend that over the longer term, a variable defined as cost adjusted by a function of income be explored when additional choice data (revealed or stated preference) becomes available.
- Reliability was found to be statistically insignificant for business trips. This was not entirely unexpected, as some panel members suspect that the effects of reliability are embedded in the constants due to an inability of SP data questions to fully capture reliability as viewed by the user. New data collection should consider representing reliability in terms of the distribution of possible travel times, so that a variable could be constructed representing the time difference between the median and 80th (or 90th) percentile of the time distribution. Small, Brownstone, and colleagues, who have devoted substantial efforts to studying the usefulness of alternative measures of reliability, has adopted this formulation. It was also felt that reliability might become a more significant determinant of behavior as highway congestion increases. In principle, reliability is a relevant policy variable for designing a rail system because it can help guide operational decision-making. In practice, however, reliability cannot be forecasted accurately enough at this time for it to be a useful part of the demand model for its short- and medium-term uses. Rather, it would be desirable to include this variable as an enhancement of models to be estimated for longer-term future uses.
- Including non-linear distance interaction effects led to a significant improvement in model fit without major changes in time, cost, or other coefficients. We agree with the CS proposal to include it as in Interim Models 2A and 2B in Table 4 of Cambridge Systematics (2011). Additional refinements for the longer term that are worth exploring are: (1) replacing the distance interaction with use of non-linear transforms of the base variables (e.g., powers of line haul travel time); and (2) differentiating non-linear distance interaction effects or non-linear transforms of base variables by time of day.

Overall we were satisfied with the estimation results, and strongly endorse their inclusion in the next version of the modeling system.

4.2 Long Distance Mode Choice Model for Non-Business Trips

CS has tested several alternative formulations of the model of non-business and non-commuting trips over the past several months. The most promising ones were shared with us during the May 2-3 meeting in San Francisco and in subsequent videoconferences. In this model, unlike the model of business trips, the inclusion of income led to unsatisfactory results, leading us to recommend removing income from this portion of the model until further investigation with new data can take place.

Paradoxically, reliability proved to be a reasonably strong factor in this model, whereas it was not for the business long distance travel. Because of that paradox, we recommended that reliability be excluded from this model, as well as the model for business trips, for the reasons outlined in Section 4.1.

The specification and interpretation of the headway coefficient were discussed at length, as in the case of the model of business trips. As before, one cannot choose between competing specifications solely based on estimation results. We were concerned that the SP experiment described to survey respondents included frequencies between one and two trains per hour, but that the application range is much larger. As a result, any tapering effect at higher frequencies, which is likely a priori and might be important to forecasts, would not be detected within the bounds of the SP survey. In this case, the difference between using frequency versus logarithm of frequency as a variable would be important. Insofar as it is feasible and fits well, we recommends that the same specification be used in both the business and non-business long distance models.

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We make the same recommendations with respect to the distance coefficient in this model as it does for the model of long-distance business trips. Overall, we are satisfied with the estimation results, view the resulting model as superior to the current formulation, and recommend that this enhanced model be implemented as quickly as possible. Future analyses should examine a non-linear transformation of several variables in place of interactions with distance.

4.3 Models of Short-Distance and of Pooled Short and Long-Distance Trips

The CS team briefly presented three short distance models. They covered business, commuting, and non-business travel. In addition, the team presented a combined model of mode choice that includes both short and long-distance trips. These models each had some advantages and disadvantages, leading us to recommend further model development. It noted that when the in-vehicle time, cost, and service frequency variables were differentiated between commuting versus business travel, the resulting coefficients were significantly different, suggesting the need for separating these two purposes.

4.4 Restructuring the Segmentation of Trips by Purpose Rather than Distance

CS estimated models that differentiated between commuting and business travel. Several interesting results were obtained, including a reduction in the magnitudes of the in-vehicle time coefficients relative to the current model, smaller egress logsum coefficients, and reasonable implied values of time by income segment. However, the nesting coefficients were slightly higher than 1.0 (although perhaps not significantly so), and model fit was better for business-only travel versus pooled commuting and business purposes. When the in-vehicle time, cost, and service frequency variables were differentiated between commuting versus business travel, the resulting coefficients were significantly different, suggesting the need for separating these two purposes.

5 Conclusions

The work completed by CS since the first meeting of the panel has greatly improved our confidence in the existing model. We were encouraged by the depth and extent to which CS addressed the short-term issues we identified in January. Further, we support the work that CS has undertaken to date for model improvement. This conclusion is based upon the work they have done to address those issues identified by ourselves and critics as potentially critical shortcomings of the model. In addition, our examination of additional data and analyses provided to us by CS, has led us to determine that these issues are not critical to current applications of the model.

We also find that the strategy being used by CS to go forward, namely building a substantially improved model for future work, is paying off very well. Key to this strategy are improvements to the mode choice model, which have in part now been completed as described in Section 4 of this report, and we believe this component of the model will provide a sound basis for the further demands on the model called for by future forecasting needs.

References

California High-Speed Rail Authority [CHSRA] (2010), "California High-Speed Rail Authority response to the UC Berkeley ITS Review."

Cambridge Systematics, Inc. (2006), "Interregional model system development - final report."

Cambridge Systematics, Inc. (2011), "Information requested in 'Section 3.2 Validation and Documentation' of the Independent Peer Review of the California High-Speed Rail Ridership and Revenue Forecasting Process, 2005-10, Draft Report for Internal Review."

Vrtic, M. and Axhausen, K.W. (2003), Verifizierung von Prognosemethoden im Personenverkehr: Ergebnisse einer Vorher-/Nachher Untersuchung auf der Grundlage eines netzbasierten Verkehrsmodells, Endbericht an die SBB - Division Personenverkehr und Bundesamt für Raumentwicklung – Technischer Bericht, IVT, ETH Zürich, Zürich.

The CHSRA and Cambridge Systematics references are available online at http://www.cahighspeedrail.ca.gov/Ridership_and_Revenue_Forecasting_Study.aspx

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

Attachment 3

Law Offices of
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December 4, 2009

Mr. Dan Leavitt, Deputy Director
California High-Speed Rail
Authority,
925 L Street, Suite 1425
Sacramento, CA 95814

ATTN: Altamont Corridor Rail
Project EIR/EIS

RE: Notice of Preparation for Environmental Impact Report/ Environmental Impact Statement (EIR/EIS) for Altamont Corridor Rail Project from Stockton to San Jose, California.

Dear Mr. Leavitt:

Thank you for the opportunity to provide scoping comments for the EIR/EIS for the above-referenced project. These comments are provided on behalf of my clients: the Planning and Conservation League, the California Rail Foundation, and the Transportation Solutions Defense and Education Fund.

My clients appreciate the Authority's moving forward on preparing an EIR/EIS for this very important project. However, my clients are concerned that it does not appear that the proposed project is currently funded. A basic question, therefore, is the feasibility of this project in the absence of funding. From that standpoint, my clients believe that it is important that the alternatives section of the EIR/EIS consider alternative projects that might have greater feasibility, i.e., a better prospect of funding. In particular, especially given that the Authority is being required to revise its Programmatic EIR/EIS for the Bay Area to Central Valley High-Speed Rail Project and revisit its decisions on that project, my clients believe the EIR/EIS needs to include consideration of an alternative where the Altamont Rail Corridor alignment serves as the route for that project. Such an alternative would provide funding for the Altamont Rail Corridor. In addition, the combined project would add the benefit of the resulting ACE service between the Northern San Joaquin Valley and San Jose to the benefits of the previously approved Bay Area to Central Valley High-Speed Rail Project, without increasing project costs.

In addition, this alternative would allow High-Speed Rail service to be extended from San Jose to Sacramento in an earlier time frame, at a lower cost and with a much higher ridership than would otherwise be possible.

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

The I-580 Alternative

This Alternative seeks to achieve the fastest possible travel times through the Tri-Valley at the lowest cost and with the least disturbance of residents. To avoid the substantial expense of tunneling and/or bridging through the Niles Canyon area, an existing rail right-of-way would be converted from the BART gauge to standard gauge. This alternative would take advantage of the proposed BART Livermore Extension, now in its DEIR comment process, by replacing the proposed BART service with ACE service and adding a new Isabel/I-580 station. The alternative would thus provide for a Livermore Extension.[1] High-Speed and ACE trains would emerge into the Tri-Valley from the tunnel through the Altamont Pass and travel entirely within the I-580 right-of-way, thus minimizing travel time, construction cost and community impacts. The Dublin and Isabel stations would be built with proper height platforms, and equipped, if possible, with a center run-through track for express service. This Alternative would be far more cost-effective than separately building both a BART Livermore Extension and an Altamont Corridor Rail Project. Using standard gauge, HSR-compatible tracks would also add the flexibility of being able to connect a wide variety of destinations with direct local and express service.

The I-580 rail right-of-way would then connect to the Capitol Corridor to San Jose. (See attached map, where the short purple line indicates a cut-and-cover tunnel under a high school's athletic fields.) If a wye were installed at that point, ACE and HSR service to Oakland could be provided as well. An intermodal station would be built either where the I-580 rail line crosses the BART Fremont line, or at Shinn Street, allowing transfers to the existing BART system. Especially if purchase of this portion of the Capitol Corridor became possible, it would enable greatly improved service not only to downtown San Jose, but also to North San Jose and Santa Clara, with associated greater ridership and larger travel market.

The Transbay Alternative

While not part of the proposed alignment for the Altamont Corridor Rail Project, my clients also ask that the Authority study an alternative route that would enable both ACE and High-Speed Rail trains on the Altamont Corridor to access the Caltrain Corridor to San Francisco. To connect the Altamont Corridor to San Francisco, the I-580 rail corridor could be extended along I-238 into San Leandro. It would then use a cover-and-cut tunnel under Lewelling Blvd., until turning to parallel the Bay shoreline. From there it would travel south,

[1] While the alternative designates the rail gauge and cities served, it is agnostic on the political question of which agency--BART, ACE or the CAHSRA--would operate the service.

roughly parallel to the shoreline, until turning onto a new two-track high rail bridge, parallel and next to the San Mateo Bridge. (See attached map.) Once across the Bay, the tracks would connect into the Caltrain Corridor via an AirTrain station near the Airport. This alternative, by avoiding residential areas along the Peninsula, would also avoid the significant community impacts identified in previously-studied Bay Area to Central Valley Alternatives.

By connecting to the Caltrain Corridor much further north than other proposed alternatives, this Transbay Alternative would also eliminate much of the conflict with UP freight traffic on that Corridor, making the remaining conflicts more manageable. Building this rail bridge would have the added benefit of providing additional Transbay capacity for future growth of BART ridership. Providing a separate connection to San Francisco for Tri-Valley and Central Valley travelers would remove a substantial passenger load from the Transbay Tube, thereby freeing up capacity for expected growth of demand for BART service in the Inner East Bay.

The Local Service Alternative

If funding can be found for proposed Smart Growth efforts in Livermore, a low-cost Local Service Alternative could also be included. This alternative would divert from the I-580 rail right-of-way to join either the current ACE alignment or the former SPRR right-of-way as close to the tunnel as possible. A single-track line dedicated to HSR-compatible trainsets, with passing sidings as needed, would serve stations at Vasco Road and Downtown Livermore. With funding for this Local Service Alternative, there would be no need to build a station at Isabel, thus enabling higher operating speeds on the main line, with only one HSR stop in the Tri-Valley. This line would have adequate capacity for the service levels expected for this area, while reducing construction costs and the need to acquire additional right-of-way. This alternative would provide a low-cost, low-impact connection from the Downtown Livermore station to the I-580 rail right-of-way. It is not clear that any of the current BART Livermore Extension alternatives meet these criteria.

Oakland Alternative

Another alternative that should be considered, in that same context, is a corridor that would provide direct service to Oakland as well as to San Jose. In addition to the service to Oakland *per se*, this option could also provide greatly improved service to San Francisco as well.

Cumulative Impacts

The EIR/EIS should also more generally include a discussion of cumulative impacts including both the Altamont Corridor Project's impacts and those of the two high-speed rail projects being conducted by the authority (the Los Angeles to Fresno

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

segment and the Fresno to San Francisco segment). Of course, an alternative that integrates the Altamont Corridor Project into the Bay Area to Central Valley High-Speed Rail Project would automatically include such cumulative impacts in its analysis.

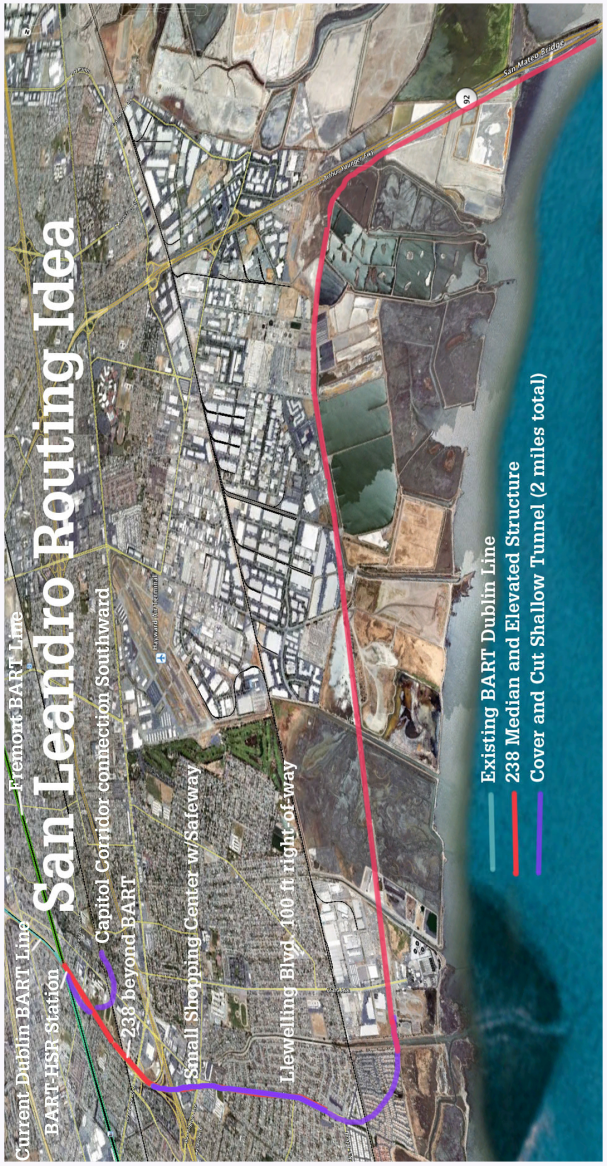
The EIR/EIS should also take into account the potential problems that would be created for the Bay Area to Central Valley High-Speed Rail Project if the Authority is unable to reach agreement with the Union Pacific Railroad (UP), pursuant to that company's MOU with the Peninsula Joint Powers Authority, over the High-Speed Rail Authority's use of the Caltrain right-of-way for intercity passenger rail service. At the moment, it appears that such an agreement is unlikely. Consequently, the EIR/EIS needs to discuss the impact on Bay Area transit service, including the Altamont Rail Corridor Project, and on regional GHG emissions if the High-Speed Rail line is unable to use the Caltrain right-of-way between San Francisco and San Jose.

Finally, if the Authority is unable to reach agreement with UP over use of the Caltrain right-of-way, the EIR/EIS should include discussion of alternative approaches to extending service from the Altamont Corridor Project into San Francisco. These should include, in addition to extending corridor service into downtown Oakland and connecting to BART at that point, extending service into another part of Oakland (e.g., the Oakland Coliseum area) and connecting to BART at that point, or options for a new Bay Crossing, perhaps combining both local and regional rail service, similar to that suggested above, that could provide direct access to San Francisco without the need to use the Caltrain right-of-way.

Thank you for allowing these comments on the proposed scope of the Altamont Rail Corridor Project EIR/EIS. Please keep me, and my clients, informed of future developments on this project.

Most sincerely,

Stuart M. Flashman



Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

Attachment 4

Statement on California High-Speed Rail by:
Congresswoman Anna G. Eshoo
Senator S. Joseph Simitian
Assemblyman Richard S. Gordon

April 18, 2011

Since the passage of Proposition 1A in 2008, each of us has expressed our support for "high-speed rail done right," by which we mean a genuinely statewide system that makes prudent use of limited public funds and which is responsive to legitimate concerns about the impact of high-speed rail on our cities, towns, neighborhoods and homes.

To date, however, the California High Speed Rail Authority has failed to develop and describe such a system for the Peninsula and South Bay. For that reason, we have taken it upon ourselves today to set forth some basic parameters for what "high-speed rail done right" looks like in our region.

We start with the premise that for the Authority to succeed in its statewide mission it must be sensitive and responsive to local concerns about local impacts. Moreover, it is undeniable that funding will be severely limited at both the state and national levels for the foreseeable future.

Much of the projected cost for the San Jose to San Francisco leg of the project is driven by the fact that the Authority has, to date, proposed what is essentially a second rail system for the Peninsula and South Bay, unnecessarily duplicating existing usable infrastructure. Even if such a duplicative system could be constructed without adverse impact along the CalTrain corridor, and we do not believe it can, the cost of such duplication simply cannot be justified.

If we can barely find the funds to do high speed rail right, we most certainly cannot find the funds to do high speed rail wrong.

Accordingly, we call upon the High-Speed Rail Authority and our local CalTrain Joint Powers Board to develop plans for a blended system that integrates high-speed rail with a 21st Century CalTrain.

To that end:

- We explicitly reject the notion of high-speed rail running from San Jose to San Francisco on an elevated structure or "viaduct"; and we call on the High-Speed Rail Authority to eliminate further consideration of an aerial option;

- We fully expect that high-speed rail running from San Jose to San Francisco can and should remain within the existing CalTrain right of way; and,

- Third and finally, consistent with a project of this more limited scope, the Authority should abandon its preparation of an EIR (Environmental Impact Report) for a phased project of larger

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

dimensions over a 25 year timeframe. Continuing to plan for a project of this scope in the face of limited funding and growing community resistance is a fool's errand; and is particularly ill-advised when predicated on ridership projections that are less than credible.

Within the existing right-of-way, at or below grade, a single blended system could allow high-speed rail arriving in San Jose to continue north in a seamless fashion as part of a 21st Century CalTrain (using some combination of electrification, positive train control, new rolling stock and/or other appropriate upgrades) while maintaining the currently projected speeds and travel time for high-speed rail.

The net result of such a system would be a substantially upgraded commuter service for Peninsula and South Bay residents capable of accommodating high-speed rail from San Jose to San Francisco.

All of this is possible, but only if the High-Speed Rail Authority takes this opportunity to rethink its direction.

Over the course of the past 18 months the Authority has come under considerable criticism from the California Legislative Analyst's Office, the Bureau of State Audits, the California Office of the Inspector General, the Authority's own Peer Review Group and the Institute of Transportation Studies at the University of California at Berkeley. The Authority would do well to take these critiques to heart, and to make them the basis for a renewed and improved effort.

Frankly, a great many of our constituents are convinced that the High-Speed Rail Authority has already wandered so far afield that it is too late for a successful course correction. We hope the Authority can prove otherwise.

An essential first step is a rethinking of the Authority's plans for the Peninsula and South Bay. A commitment to a project which eschews an aerial viaduct, stays within the existing right-of-way, sets aside any notion of a phased project expansion at a later date, and incorporates the necessary upgrades for CalTrain - which would produce a truly blended system along the CalTrain corridor - is the essential next step.

Attachment 5

Caltrain Capacity Analysis Update

August / September 2011 Stakeholder Meetings

Presentation Topics

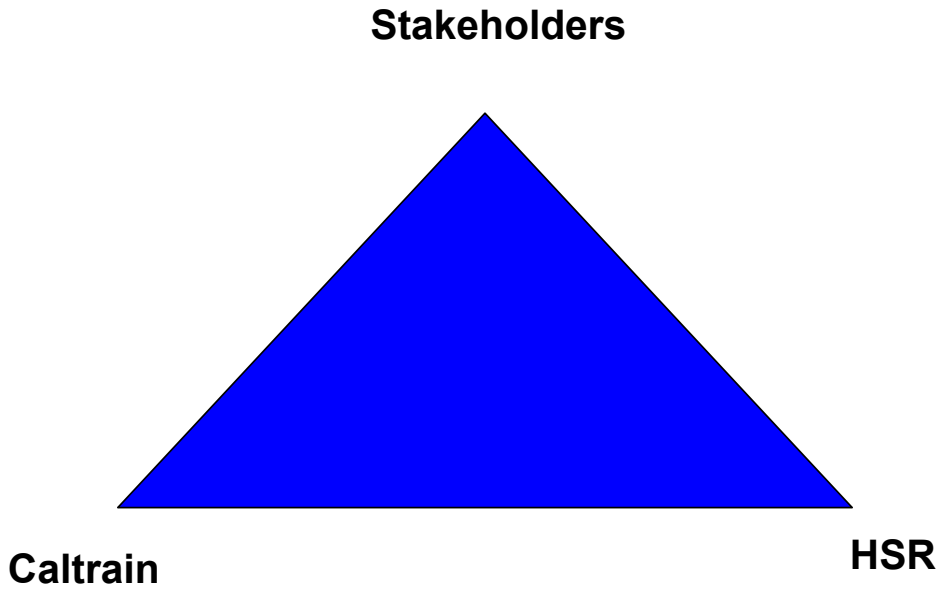
- Modernization Program
- Capacity Analysis Update
  - Context
  - Preliminary Findings
- Next Steps
- Discussion

2

Caltrain Modernization Program

3

Partnership



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Caltrain Program Focus Areas

- Projects
  - Caltrain Electrification
  - Advanced Signal Upgrade
- Coordinated Planning
  - HSR
  - Stakeholders

5

Capacity Analysis Update

6

HSR Context

- HSR Priority Segments
  - Merced to Fresno; Fresno to Bakersfield
  - Spring 2012 Environmental Clearance
- HSR Business Plan
  - Initial Operating Segment being defined
  - Extend North? South?
- SF to SJ Segment
  - Design and EIR/EIS work on hold

7

Peninsula Vision

- Elected officials call for "blended system"
- What is it?
  - System from SJ to Transbay Terminal
  - Support both Caltrain and HSR
  - Utilize existing right of way and tracks
  - Minimize impacts to communities
  - Lower project cost

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Caltrain Capacity Analysis

- Is the "blended system" concept feasible?
- Multiple considerations
  - **Operational**
    - Infrastructure
    - Cost (Capital & Operating)
    - Ridership
    - Prop 1A requirements
    - CEQA/NEPA requirements

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Scope of Work

- LTK Engineering Services
- Build simulation model
  - Main Line
  - Terminals
- 1st set of model runs / analysis
- **Preliminary Findings (Summer)**
- 2nd set of model runs / analysis
- Draft Analysis

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Simulation Model - System and Train

System	Electric Advanced Signal System
Trains	Caltrain EMU trains High-speed rail trains

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Simulation Model –Tracks

Base	Mainline (4th & King to Diridon) Current Capital Projects – San Bruno – South Terminal
Additions	HSR Stations – 4th and King – Millbrae – Diridon

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Simulation Model – Passing Tracks

Tested	North (4 track section) *(Bayshore to Millbrae)* → **Middle (4 track section)** ***(Hayward Park to Redwood City)*** *(Hayward Park to San Carlos)*
Not Yet Tested	South (4 track section) Long (3 track section)

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Preliminary Findings

- Blended system concept has merit
- Potential up to 10 trains / hour / direction

Passing Tracks Middle (4 track section)	No	Yes
Caltrain	6	6
HSR	2	4

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Tested Service Characteristics

	Caltrain	HSR
Travel Speeds *(up to)*	79mph*	79mph 110mph
Headways *(peak hour)*	6 trains (5 - 20 min.)	Without passing tracks 1 train (60 min.) 2 trains (30 min.)
	6 trains (5 - 15 min.)	With passing tracks 3 trains (20 min.) 4 trains (15 min.)
Station Stops *(one-way)*	13 -14	3

**Note: Caltrain to be tested at up to 110mph*

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Next Steps

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Outreach

- Scheduled Public Venues
  - San Mateo Rail Corridor Working Group (August 17th)
  - Friends of Caltrain (August 19th)
  - Peninsula Cities Consortium (September 2nd)

- Other
  - Transportation Agencies
  - Cities / Counties
  - Bay Area Council
  - San Francisco Planning + Urban Research Association
  - Peninsula Freight Rail User's Group

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Concept Development

- Additional rail service simulations / analysis
- Design
  - Passing tracks (4 track section) location
  - Grade crossings upgrades/separations/closures
  - System upgrades
- Project cost estimate

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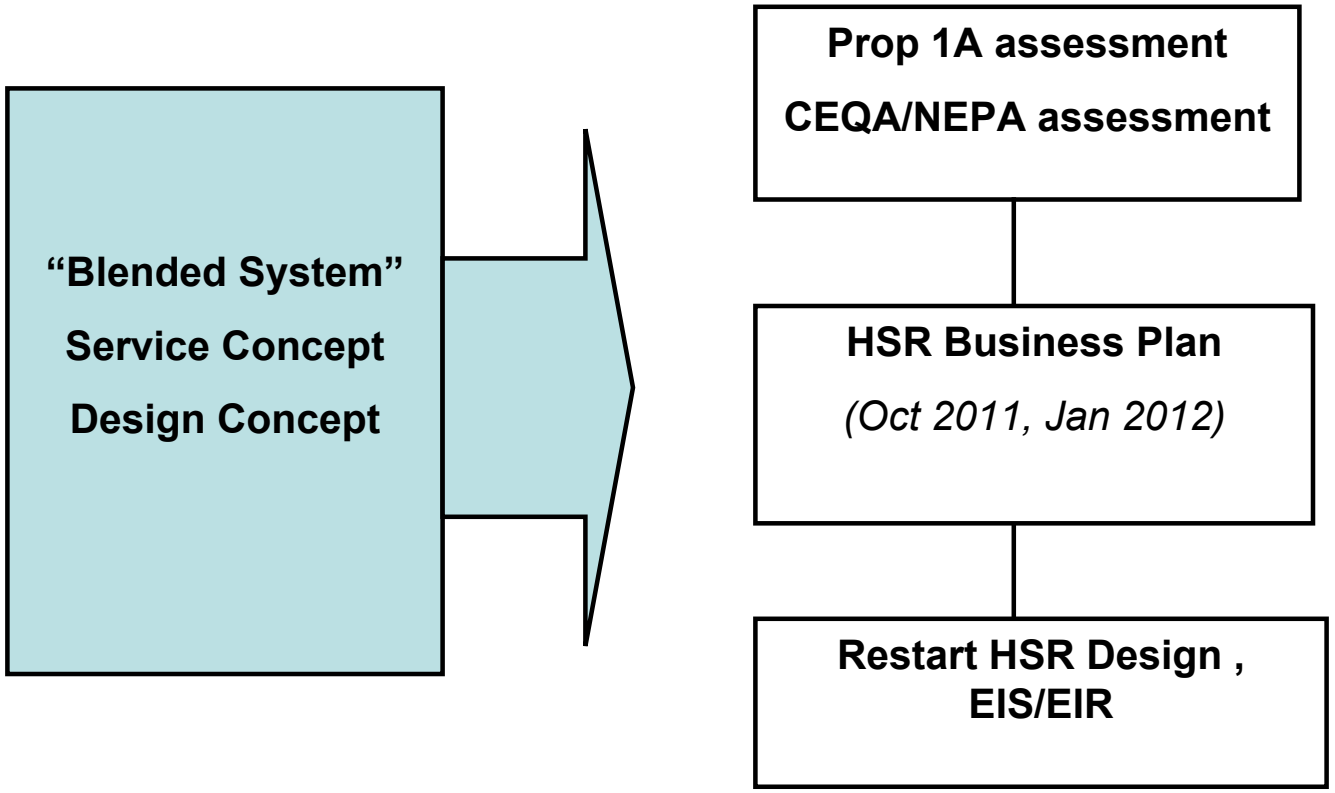
HSR Coordination



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Discussion

Contact Information:

Caltrain Modernization Program

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Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

Attachment 6

November 2011

Dear Stakeholders,

Caltrain needs to be modernized.

We need to implement Caltrain electrification, procure electric trains and install CBOSS PTC (an advanced signal system). These efforts will allow us to operate an electric rail service that is safer, more efficient and "greener".

The vision for Caltrain is clear and has been confirmed by the Joint Powers Board and the region. However, funding for modernizing the system has been illusive and the greatest impediment to project advancement.

In 2008, the voters approved Proposition 1A which authorized state funding for high speed rail in California. This was clearly a significant milestone for the state of California, but also for Caltrain.

The high speed rail project, an electrified system, has been defined to use the Caltrain corridor to reach its northern terminus, downtown San Francisco. What this means is that Caltrain and high speed rail can combine local and new resources to advance electrification of the Peninsula rail corridor.

Since the passage of Proposition 1A, Caltrain and high-speed rail have been defining infrastructure needs to provide enhanced local, regional and statewide high speed rail transit service.

Originally envisioned was significant expansion of the existing Caltrain corridor to support a four- track system. However, such an expansion would have significant impacts on local communities that are difficult to justify for the foreseeable future.

In 2011, in response to growing local concerns, US Congresswoman Anna Eshoo, State Senator Joe Simitian and State Assemblyman Rich Gordon, challenged us to rescope the project and minimize impacts. They called for a "blended system" which would have both Caltrain and high speed rail using the existing tracks (primarily a two track system) to the greatest extent possible instead of expanding to a four track system along the entire corridor.

As a first step in exploring the feasibility of a blended system, Caltrain needed to understand if sharing the tracks was operationally feasible and acceptable.

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

The attached report is an operational analysis conducted by LTK Engineering Services, prepared for Caltrain. The analysis shows that a blended system in the Caltrain corridor is operationally viable. The attached report is a "proof of concept" showing tested service scenarios supporting both Caltrain and high speed rail systems on shared tracks. It is important to know that this report does not define "the" service plan to be implemented. Separate and following this analysis, additional studies and dialogue with stakeholders need be done before specifying what the blended system will ultimately be.

It is with a genuine sense of optimism that I share this report with you. The results of this study give us a reason to begin a new collaborative dialogue on how we might shape the future of our Caltrain corridor for our customers today and tomorrow. I look forward to continuing to work with you in shaping our future.

Michael J. Scanlon

Draft

Caltrain/California HSR
Blended Operations Analysis

Prepared for:
Peninsula Corridor Joint Powers Board (PCJPB)

Prepared by:
LTK Engineering Services

November 2011

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

Table of Contents

0 Executive Summary

This report presents the results of detailed operational analyses of multiple "blended system" solutions for accommodating future Caltrain commuter rail and high speed rail services on the Caltrain Corridor between San Jose and San Francisco. These solutions are based on two services sharing rail tracks along most segments of the Corridor.

The operational analysis was based primarily on a computer simulation model of the Caltrain Corridor, capturing the trains, station stop (dwell) times, tested schedules, track, signals and track junctions (interlockings) of the future system. The computer simulation model software used to conduct the analysis, TrainOps®, is a proprietary software application developed by LTK Engineering Services. The model was customized for application to the Caltrain and high speed rail operations analysis.

The virtual world modeled in the simulation software is different than the current Caltrain system. Key differences include electrification of the Caltrain system, new Caltrain rail cars ("rolling stock") that have electric propulsion and an advanced signal system (CBOSS PTC). With electrification and an advanced signal system in place, the simulation model reflects a Caltrain Corridor with superior performance attributes compared to today's diesel system. This results in the ability to support more train traffic than can be supported today.

In some versions of the simulation model, limited new tracks in select areas of the corridor to support high speed rail stations and passing (overtake) locations to allow high speed rail trains to bypass Caltrain trains were assumed. Versions of the simulation model also varied in terms of simulated Caltrain and high speed rail train speeds, ranging from 79 mph to 110 mph.

The key findings from the simulation model and associated operations analysis are as follows:

- A blended operation on the Caltrain Corridor where Caltrain and high-speed trains are sharing tracks is conceptually feasible.
- An electrified system with an advanced signal system and electric trains increases the ability to support future train growth in the corridor.
- The blended system without passing tracks for train overtakes can reliably support up to 6 Caltrain trains and 2 high speed rail trains per peak hour per direction.
- The blended system with passing tracks for overtakes can reliably support up to 6 Caltrain trains and 4 high speed rail trains per peak hour per direction.
- Supporting high speed rail trains result in non-uniform Caltrain headways.
- Increasing speeds from up to 79 mph to 110 mph decreases travel times for both rail services.

The findings from this analysis should be viewed as a "proof of concept" in analyzing the conceptual feasibility of blended operations. The assumptions in the analysis

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

should be considered as test inputs for analysis and should not be considered as decisions on what the blended system will look like. It is also important to note that the findings are based on a simulation modeling exercise; additional due diligence is needed to ensure that the findings provide sufficient reliability and flexibility for "real world" rail operations.

With a key finding that the Caltrain Corridor blended operations is conceptually feasible; this technical report should be used as a basis for additional discussion by stakeholders for exploring and refining the many blended system alternatives. Subsequent work to be completed include: engineering, identifying maintenance needs, cost estimating, ridership forecasts and environmental clearance.

1 Introduction

This report provides a high level overview and detailed technical assumptions of the feasibility analysis of Caltrain Corridor "blended operations." The blended operations concept reflects Caltrain commuter rail and California High Speed Rail (HSR) trains commingled on the same tracks for much of the Corridor between San Francisco and San Jose. A number of smaller scale infrastructure enhancements have been suggested to enhance the blended operations concept, allowing a greater number of overall trains on the Corridor and/or ensuring that trains operate with virtually no delay due to congestion on the line.

Blended operations being conceptually feasible means identifying future scenarios where the desired level of commuter and high speed rail service can be accommodated and these services can operate with virtually no delays (increased travel time) from terminal to terminal. The basis for assessing the conceptual feasibility of blended operations must include "practical" – as opposed to "theoretical" – assumptions such that any forecasts operational results are achievable under the inevitable day-to-day variations in weather, passenger loads, rolling stock performance, infrastructure availability and the like.

LTK Engineering Services (LTK), working closely with multiple Caltrain departments and California High Speed Rail Program Management staff, was responsible for performing the feasibility analysis of blended operations. LTK was retained by Caltrain for the analysis and worked closely with both future rail operators to ensure concurrence with assumptions and methodologies before advancing the work.

The blended operations analysis used a computer simulation model of the Caltrain Corridor that spanned the territory from Tamien Station, south of San Jose, to the San Francisco terminal at 4th and King. The model replicated the behavior of trains, station stop (dwell) times, schedules, track, signals and track junctions (interlockings), including the dynamic interaction of these entities in the complex railroad operating environment.

The smaller scale infrastructure enhancements consist of short sections of additional railroad track to be used by faster trains (HSR) to overtake (pass) slower trains (Caltrain). During the morning and evening peak period, the higher volume of both HSR and Caltrain trains means that overtakes happen in both directions at about the same time.

The overall guiding criterion for defining overtake segment options is that operational overtakes should improve integration of HSR and Caltrain services with neither service being routinely delayed at an overtake location by the other service. Other criteria include the following:

- Overtake tracks should be located where their construction and operation limit impacts to adjoining communities,

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

- Overtake tracks should be sufficiently long to support 7+ minute travel time difference between commuter and HSR trains; and
- Overtake tracks should connect to existing four-track segments of the Caltrain Corridor where possible to minimize capital cost.

The computer simulation model software used to conduct the analysis, TrainOps®, is a proprietary software application developed by LTK Engineering Services. The model was customized for application to the Caltrain and high speed rail operations analysis.

The future "no build" (no action) scenario modeled in the simulation software is different than the current Caltrain system, including differences in propulsion (electrification versus the current diesel propulsion), rail cars (electrified vehicles versus the current diesel locomotive-pulled coaches) and signal system (advanced communications-based system versus a wayside-only system with discrete update locations along the track). With electrification and an advanced signal system in place, the simulation model reflects a Caltrain Corridor with superior performance attributes compared to today's diesel system.

An incremental approach was used in the development of blended operations scenarios. The model started with the "6/0" scenarios (6 Caltrain and 0 HSR trains per peak hour per direction), then layered in additional HSR trains.

HSR frequencies were increased from an initial service level of 1 train per hour per direction to up to 4 trains per hour (bringing total Corridor train volumes to 10 trains per hour per direction). At the same time, Caltrain scheduling strategies (i.e. modifying train stopping patterns) varying maximum operating speeds and assumed infrastructure were also tested, with each scenario changing only one variable (scheduling strategies, train volume, infrastructure or maximum operating speed) at a time so that the impact of the change could be precisely understood.

Where a simulated train volume in a given scenario resulted in unacceptable train congestion and delays for a given infrastructure and a given maximum operating speed, the follow-on simulation scenarios with higher train volumes appropriately included additional infrastructure or changes in maximum operating speeds to eliminate the unacceptable train congestion and delays.

This incremental "three dimensional matrix" of service level, maximum train speed and infrastructure produced a very large number of potential scenarios, which was limited to a number that could actually be simulated in a reasonable time by using the results of initial scenarios to guide the study team in identifying subsequent scenarios that showed promise of blended operations conceptual feasibility. By using "practical" (conservative) input assumptions and appropriate schedule margin ("pad" or "recovery allowance"), the Study team had confidence that simulated blended operations conceptual feasibility can be translated into actual operational feasibility in "real world" conditions.

Included in this report are the details of the simulation modeling effort and the key findings. Chapter 2 provides information about the TrainOps simulation modeling tool used for the analysis. Chapter 3 focuses on the assumptions and inputs into the Caltrain Corridor model and the individual scenarios tested. Chapter 4 details the simulation results specific to individual scenarios as well as overall assessment of the conceptual feasibility of blended operations. Chapter 5 summarizes the key findings and next steps.

The report also includes three appendices. Appendix A includes detailed tables of Caltrain tested schedule changes required for certain future simulation scenarios. Appendix B includes graphical time-distance ("string") charts that reflect the peak period simulated train performance of all of the trains operating in the Caltrain Corridor in each scenario. Appendix C provides a glossary of technical and railroad operational terms for the reader's convenience.

2 TrainOps® Simulation Modeling Tool

Summary: This chapter describes the computer software application (TrainOps) that was used to conduct the simulations for the Caltrain Corridor "blended operations." The software validation process and examples of other rail systems that have used this software application are also described.

2.1 General Description and Capabilities

The TrainOps simulation modeling tool is a proprietary software application developed and enhanced by LTK Engineering Services. TrainOps was specifically enhanced for application to the Caltrain/California HSR Blended Operations Analysis in order to accurately model the specified functionality of an advanced signal system, known as Communications Based Overlay Signal System Positive Train Control (CBOSS PTC) system planned for the Caltrain Corridor.

More generally, TrainOps accurately models the performance of individual trains and the interaction of trains, based on user inputs for rolling stock, track alignment, train control, dispatching and operating plans.

The program provides user-friendly inputs (including the ability to "cut and paste" from spreadsheets) for all relevant system and rolling characteristics, including:

- Route alignment data, including track gradients, horizontal alignment and speed restrictions (which can differ by train class),
- Passenger station locations,
- Train data, including weight, dimensions, propulsion system characteristics, and braking system parameters,
- System train control data, including wayside signaling, cab signaling and Positive Train Control inputs,
- Operations data, such as train consist sizes, train consist manipulations at terminals/yards, operating plan (timetable) inputs, passenger station stopping pattern, and station dwell times.

2.2 Software Validation

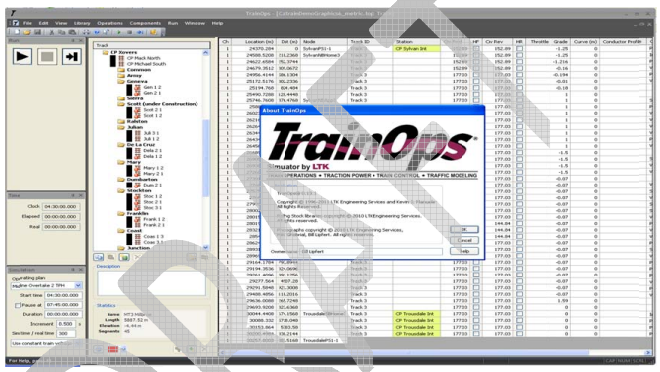
TrainOps was first developed in 1996 by LTK Engineering Services and has been continually enhanced and upgraded in the last 15 years. These enhancements include the addition of new features and ability to model new technologies, as well as adding support for the latest Windows operating systems.

As part of the Caltrain/California HSR assignment, TrainOps was enhanced to support the unique functional attributes of Caltrain's planned CBOSS PTC system. Each software enhancement, whether a generic upgrade for general purpose modeling or a project-specific upgrade such as that for CBOSS PTC, is subject to extensive internal QA/QC procedures, including 800+ functional tests.

The purpose of these tests is to ensure that all previously approved software functions continue to operate as specified after the addition of new capabilities. These tests use simplified databases designed to rapidly test each software function. In addition, LTK maintains a large database of regression tests, which consist of complex databases designed to verify the correct interaction of multiple software features. Each regression test has an approved "benchmark" set of results that must be replicated in order for a new release of the TrainOps software to be approved.

Figure 1 shows the initial "launch screen" of the TrainOps software.

Figure 1. TrainOps Software Launch Screen and Route Alignment Input Screen



Although TrainOps is not licensed to rail operators or other consulting engineering firms, the software has a long history of successful calibration and application. This history includes application at the following rail systems:

- Mainline Passenger Rail: Amtrak, Denver FasTracks, GO Transit (Toronto), Long Island Rail Road, NJ Transit, SEPTA,
- Heavy Rail: Massachusetts Bay Transportation Authority (Blue, Orange and Red Lines), New York City Transit, and
- Light Rail: Denver, Minneapolis, Phoenix, Portland TriMet, Portland Streetcar, Sacramento, Salt Lake City, Tucson.

Figure 2 shows a typical graphical plot of simulated velocity and simulated travel time.

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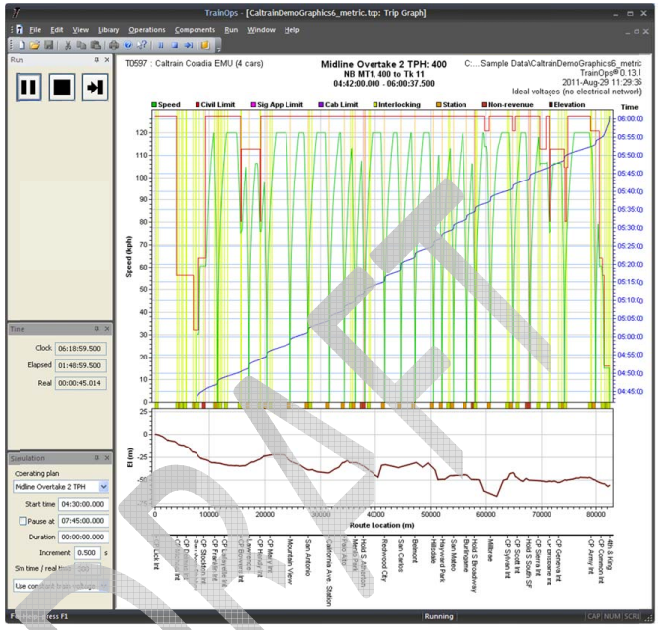
Figure 2. TrainOps Simulated Velocity



Note: Simulated Velocity (Green); Maximum Authorized Speed (Red); Time versus Distance Plot (Blue); Vertical Profile (Brown)

Traditional TrainOps analyses start with a calibration and validation effort that confirms simulation model results accurately replicate existing conditions on the rail network to be analyzed. TrainOps has been successfully calibrated to existing operations at MBTA, NYCT, NJ Transit, Amtrak and other rail networks.

For the Caltrain/California HSR Blended Operations Analysis, model calibration was not an appropriate use of resources because all model input variables for the Caltrain Corridor (infrastructure, operating plan, vehicles, train control, dwell times) are changing between today's as-in-service condition and the planned future operating condition. This means that once the future simulation scenarios are initiated, there are no calibration database entries remaining on which to leverage the future scenarios.

Instead, LTK focused on performing sensitivity testing of each model input (using a range of realistic and then extreme inputs), validating that the model responds as expected to each change in input. As part of the TrainOps QA/QC testing, LTK tested the 30 second value and also "extreme" values (0 seconds and 300 seconds) to verify that the model's prediction of delay in the event of a conflicting route responded appropriately for the range of potential inputs.

3 Assumptions and Inputs

Summary: This chapter details the assumptions of the blended operations conceptual feasibility analysis and the inputs to the supporting simulation model. Assumptions and inputs are grouped in this chapter by infrastructure (high speed rail stations and overtake track options, track speed); signal system (train control - including response time to signal system and train headways); rail vehicles (rolling stock); dispatching; and operations (service plans, simulation duration, dwell times and randomization).

The virtual world modeled for the simulation analysis is different from the current Caltrain system. The model assumes an electrified rail corridor (in contrast with today's diesel propulsion) with an advanced signal system known as Communications-Based Overlay Signal System Positive Train Control (CBOSS PTC). The planned future system will enable superior performance from that of today's diesel system.

3.1 Infrastructure

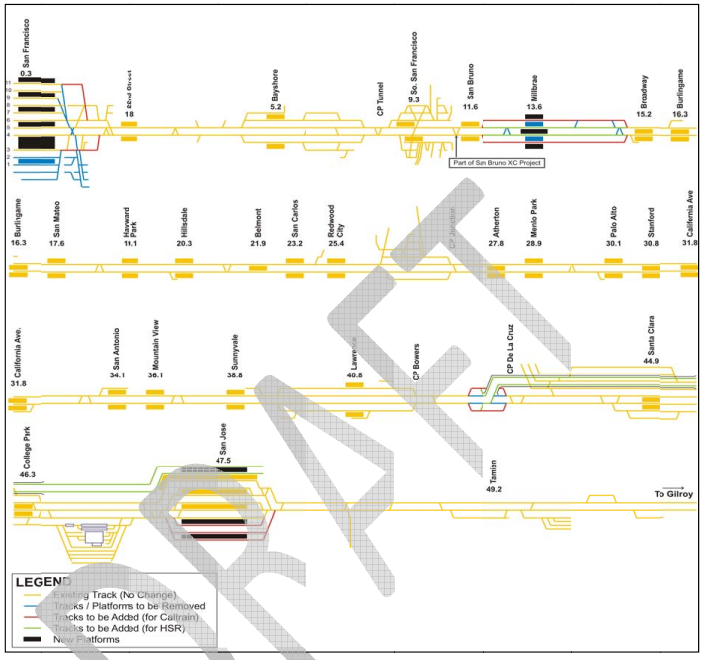
3.1.1 Existing and Under Construction Tracks

The simulation model reflects existing Caltrain tracks and interlockings from 4th and King (North Terminal) to San Jose Diridon (South Terminal) stations. It additionally also assumes the following committed track improvements currently being constructed:

- San Bruno Grade Separation Project improvements that will eliminate three highway-rail at-grade crossings,
- South Terminal (San Jose Diridon) Project which will add two new platforms at this location, and
- Santa Clara Station Project, which will remove the "hold out" rule operations at this location.

Figure 3 shows the assumptions noted above plus HSR-related improvements at North Terminal, at Millbrae and between CP De La Cruz and South Terminal. This in total is referred to as the "Baseline Infrastructure".

Figure 3. Baseline Infrastructure Track Schematic



While California HSR's long-term plan is to continue from 4th & King station to Transbay Terminal in San Francisco, this segment of HSR operation was not assumed in the simulation scenarios. For the purposes of this analysis, which focuses on the operational capabilities of the existing mainline infrastructure between San Francisco and San Jose, all HSR trains were assumed to terminate/originate at 4th & King station.

3.1.2 High Speed Rail Stations

In order to accommodate HSR service, the simulation assumed additional infrastructure at three existing Caltrain stations where HSR trains will stop. The designs for San Francisco, Millbrae and San Jose Diridon stations developed by HSR to date were incorporated into the simulation database, as described below.

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Diridon Station

In the vicinity of the San Jose Diridon Station, the design includes dedicated high speed tracks and station platforms. The dedicated two-track HSR alignment continues northward and merges into middle of the Caltrain mainline north of CP De La Cruz. It was assumed in the model that the two Caltrain tracks were spread apart with the HSR tracks accessing the existing Corridor alignment between the Caltrain tracks. The HSR tracks were assumed to merge into the Caltrain tracks using #32.7 turnout geometry, supporting 80 MPH diverging movements for HSR.

Millbrae Station

At Millbrae Station, a four-track configuration is assumed in the simulation model with two station tracks dedicated to HSR trains and two station tracks dedicated to Caltrain trains. The simulation model assumes 80 MPH diverging #32.7 high speed turnouts for HSR to access the 3rd and 4th main tracks, both north and south of Millbrae.

4th and King Station

At the 4th & King terminal Station in San Francisco, dedicated HSR station tracks with extended station platforms are assumed. This requires modifications to the terminal's interlocking layout.

3.1.3 Overtake Track Options

Overtake (passing) locations provide additional tracks to what exists today in limited segments of the corridor to be used by high speed rail trains to bypass Caltrain trains stopping at stations.

The overall guiding criterion for defining overtake segment options is that operational overtakes (one same-direction train passing another) should improve integration of commuter and high speed rail services with neither service being routinely delayed at an overtake location by the other service. Other criteria include:

- Overtake tracks should be located where their construction and operation limit impacts to adjoining communities;
- Overtake tracks being sufficiently long to support 7+ minute travel time difference between commuter and HSR trains; and
- Overtake tracks connecting to existing four-track segments where possible to minimize capital cost.

To achieve a delay-free overtake, the 4-track section contains a minimum of three Caltrain station stops for each train. Since the Caltrain future operating plan tested in this analysis features a skip-stop zone express type operation, the need for each train to make at least three station stops requires that an overtake section include at least five station locations.

In some cases, scheduling delay-free overtakes of commuter trains by HSR requires that additional stops be added to Caltrain in order to create the required 7+ minute travel time difference. These additional stops are undesirable because they increase Caltrain trip times as a result of additional scheduled station stops within the overtake segments.

The minimum 7 minutes of HSR travel time advantage is comprised of:

- 3:00 minimum following move headway (Caltrain is ahead of HSR),
- 0:30 route reestablishment time at overtake diverging interlocking,
- 0:30 route reestablishment time at overtake merging interlocking, and
- 3:00 minimum following move headway (Caltrain is behind HSR)

Four potential overtake locations have been conceptually defined. They are as follows and reflected in Figure 4:

1 The *North Overtake* assumes a 10.2-mile long 4-track segment of tracks from milepost 5 to milepost 15.2. It includes four Caltrain stations and one high speed rail station. They are Bayshore, South San Francisco, San Bruno and Millbrae. The existing 4-track configuration at Bayshore is utilized.

2 The *Full Midline Overtake* assumes a 9.1-mile long 4-track segment of tracks from milepost 18.1 to milepost 27.2. It includes five stations – Hayward Park, Hillsdale, Belmont, San Carlos and Redwood City, all of which are served only by Caltrain. While it is understood that Redwood City is being considered by California High Speed Rail as a possible mid-Peninsula station stop, HSR trains were not programmed to stop there in the simulations. The existing 4-track configuration south of Redwood City is utilized.

3 The *Short Midline Overtake* assumes a 6.1-mile long 4-track segment of tracks from milepost 18.1 to milepost 24.2. It includes four Caltrain stations, Hayward Park, Hillsdale, Belmont and San Carlos, all of which are served only by Caltrain. This option was explored to see what could be achieved if the overtake location was terminated north of Redwood City, avoiding 3rd and 4th track in a portion of the corridor where right of way constraints become more limiting.

4 The *South Overtake* assumes a 7.8-mile long 4-track segment of tracks from milepost 33.8 to milepost 41.6. It includes four Caltrain stations, San Antonio, Mountain View, Sunnyvale and Lawrence, all of which are served only by Caltrain. While it is understood that Mountain View is being considered by California High Speed Rail as a possible mid-Peninsula station stop, HSR trains were not programmed to stop there in the simulations. The existing 4-track configuration at Lawrence is utilized.

In addition to the 4-track options, a 3-track option is also being considered. Four tracks allow two dedicated tracks for high speed rail for a limited segment of the

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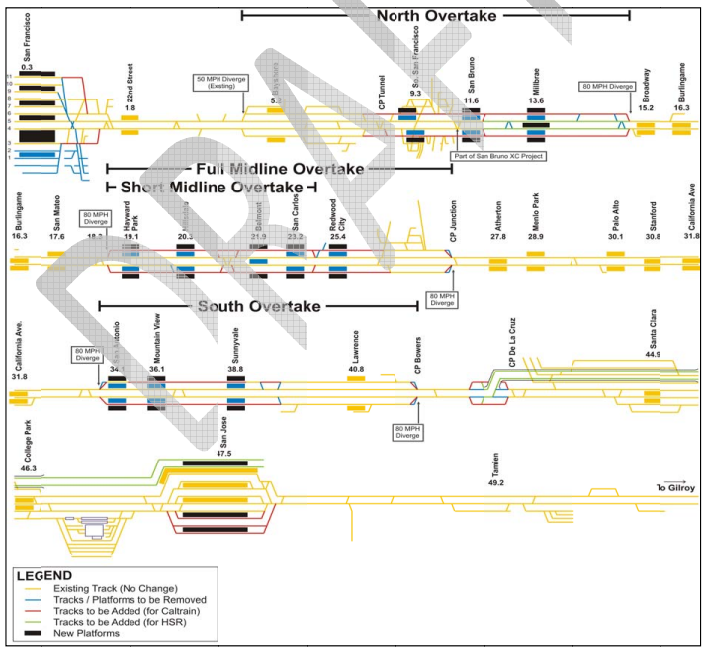
corridor – one track per direction. Three tracks allow one dedicated track for high speed rail for a limited segment of the corridor – one track that must be shared in both directions.

The North, Full Midline and Short Midline Overtakes were analyzed in the simulation model. Analysis of alternative overtake configurations was paused at this point because the Full Midline Overtake (given Caltrain's tested schedule) shows greater promise in enhancing Corridor capacity and minimizing impacts to Caltrain operations.

Further analysis of all overtake options is required to understand the location options for the overtake tracks along the Caltrain Corridor.

A complete assessment of all of the overtake options will be conducted and provided in a subsequent report.

Figure 4. Track Schematic Showing Baseline Infrastructure with Potential Overtake Trackage



3.1.4 Interlockings

All existing track junctions (interlockings) were assumed to remain in the simulation scenarios. New conceptual interlockings were implemented in the simulation model at 4th & King in San Francisco, at Millbrae, and near CP De La Cruz. Interlockings requiring single #20 turnouts, which support 45 mph diverging movements to another track, were assumed to extend 400 feet from interlocking home signal to home signal. Interlockings requiring single #32.7 high speed turnouts, which support 80 mph diverging movements to another track, were assumed to extend 800 feet from interlocking home signal to home signal.

3.1.5 Track Speed

Two maximum passenger train operating speeds have been tested: (1) up to 79 mph and (2) up to 110 mph for both Caltrain and high speed rail trains. Today, Caltrain trains operate up to 79 mph.

In order to operate trains up to 110 mph, Caltrain's track structure will need to be upgraded to a higher Federal Railroad Administration (FRA) track class with more stringent maintenance tolerances. This will require system-wide infrastructure improvements.

The specific tested speeds are as follows:

- 79/79: Caltrain and HSR trains operating at up to 79 mph along the corridor;
- 79/110: Caltrain and HSR trains operating at up to 79 mph for most of the corridor, except HSR trains operate at up to 110 MPH on the overtake tracks; and
- 110/110: Caltrain and HSR trains operating at up to 110 mph along the corridor.

In all three tested scenarios, optimal corridor throughput was achieved by having Caltrain and HSR trains operate at the same operating speeds to the greatest extent possible on shared tracks. When both operators are running close to the same speed, it allows for a "free flow" of train traffic for the tested service level maximizing corridor throughput.

In the 79/79 and 110/110 scenario, both Caltrain and HSR trains are operating at similar speeds along the whole corridor.

In the 79/110 scenario, Caltrain and HSR trains travel at similar speeds of up to 79mph on the shared tracks but on the overtake tracks used by HSR trains, HSR trains travel faster, up to 110 mph. Higher speeds on the overtake tracks enhances the corridor throughput by allowing the HSR trains to more efficiently pass the Caltrain trains. Since the differing speed is exclusive to the HSR dedicated tracks only, there are no impacts to the "free flow" of train traffic maximized by sustaining similar speeds of both systems on the shared tracks along most of the corridor.

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3.2 Train Control

3.2.1 Base Assumptions

Caltrain's existing wayside signaling system is assumed as the base of the train control system in the simulation model. The existing system does not have cab signaling or automatic train control.

The existing system generally features three-block, four-aspect control lines, meaning that two trains must be separated by three signal blocks (each about 4,000 to 5,000 feet long) for the following train to experience green ("Clear") signal aspects. The system has automatic signals, indicators along the side of the track that cannot be controlled by the dispatcher and respond automatically to track occupancy status ahead on the Caltrain Corridor.

3.2.2 CBOSS PTC Signal System Overlay Assumptions

In addition to the based train control system, the simulation model assumes an overlay advanced signal system. The advanced signal system is called CBOSS PTC (Communication-Based Overlay Signal System Positive Train Control).

CBOSS PTC, to be implemented by 2015, brings federally mandated safety benefits and performance enhancements to the Caltrain Corridor. PTC is associated with the safety attributes related to collision prevention, civil speed restrictions and roadway worker protection zones. CBOSS is associated with the attributes of the system related improved performance and capacity enhancement.

Unlike most other PTC systems under development in North America, CBOSS PTC is being designed to provide important capacity benefits on the Caltrain Corridor. These benefits emanate from two distinct features of the system. Firstly, CBOSS PTC allows trains on the Caltrain Corridor to approach signals at stop based on their individual braking performance capabilities rather than the "worst case" braking of all trains operating on the Corridor. Secondly, CBOSS PTC provides continuous updates to the train engineer about the occupancy status of the track ahead, rather than providing intermittent information only at wayside signal locations.

The overall capacity of the corridor is governed by the minimum supportable headway (in terms of time) at which the signal system permits two trains to operate at maximum speed. The capacity of each corridor segment is defined by a location-specific minimum supportable headway, with this being a function of train speed, signal layout, station spacing, train stopping patterns and train dwell times at station. The longest resulting interval between trains on the corridor defines overall Caltrain Corridor capacity.

3.2.3 Response Time

Caltrain worked with CHSR in defining appropriate signal system/CBOSS PTC response times assumed in the simulation model. Recognizing that CBOSS PTC is an overlay system, the response time of both systems must be added together to determine the overall response time for sequential actions of the two systems.

The following are the simulation parameters:

- Response time for signal system/CBOSS PTC - automatic territory – 6 seconds
- Response time for signal system/CBOSS PTC - interlocking territory (fleeting routes) – 14 seconds
- Response time for signal system/CBOSS PTC - interlocking territory (train waiting for conflicting route to clear) – 30 seconds

The 30 second time for reestablishment of a new route includes provisions for loss-of-shunt time, switch movement time, central control communication time, route establishment time and CBOSS PTC processing time.

3.2.4 Determining Minimum Train Intervals

As designed, CBOSS PTC will allow for trains to safely operate closer together than today's wayside signal system. The TrainOps software was used to determine this improvement in signal system capacity. The result of the simulation exercise determined that the minimum supportable headway would decrease from approximately six minutes (realized under the current wayside signal system) to approximately three minutes.

A simulation with two Caltrain trips that depart the terminal at an initial "trial" train interval (headway) of 1:30 (one and half minutes) and then stop and dwell at each station for 30 second dwells was created to assess the minimum system headway under CBOSS PTC.

As the trains are delayed by the CBOSS PTC system, the headway increases to the minimum supportable headway between trains, which is a function of the longest signal block clearing time and CBOSS PTC braking profile on the corridor. The results in Table 1 and Table 2 indicate that a headway of just over three minutes can be scheduled for identical all-stops trains without encountering delay. Figure 5 displays time versus distance plots of the two sets of trains, showing their CBOSS PTC-enforced headway increasing from the initial "trial" train interval to the true minimum supportable train interval of just over three minutes as they operate through the Corridor.

For sections along the Corridor with a higher signal density (shorter signal block lengths), such as from Redwood City to San Jose, the supportable headway is closer.

Included in Table 3 and Table 4, are simulation results showing two trains departing the terminals at a headway of 3:15. Figure 6 shows the time versus distance plot of the two pairs of trains as well. In this case, the trains operate with just one second of delay along the entire corridor, indicating that a headway of 3:16 represents the

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unimpeded minimum supportable headway for all-stops trains on the Corridor under CBOSS PTC. As the blended simulations show, due to the CBOSS PTC profile-based braking to the stop target ahead, variations in stopping patterns become the primary contributing factor to supportable headways along the corridor.

3.2.5 Passing Track Signal Spacing

In sections of new 3rd and 4th main track, automatic signal spacing averaging 3,000 to 4,000 feet was assumed, which is somewhat shorter than the current Caltrain automatic signal block length. Automatic signal block layouts were developed with uniform length, based on constraining fixed interlocking signal locations.

Table 1 – Minimum Supportable Caltrain Corridor CBOSS PTC Headway - Northbound Trains

Station	Lead	Following	Headway	Running Delay to Following Train
San Jose Diridon Station	0:00:00	0:01:30	0:01:30	0:00:00
Santa Clara Station	0:04:44	0:06:57	0:02:13	0:00:43
Lawrence Station	0:09:06	0:11:25	0:02:19	0:00:49
Sunnyvale Station	0:12:19	0:15:11	0:02:52	0:01:22
Mountain View Station	0:15:51	0:18:43	0:02:52	0:01:22
San Antonio Station	0:18:47	0:21:39	0:02:52	0:01:22
California Ave. Station	0:22:02	0:24:55	0:02:53	0:01:23
Palo Alto Station	0:24:45	0:27:38	0:02:53	0:01:23
Menlo Park Station	0:27:05	0:29:58	0:02:53	0:01:23
Atherton Station	0:29:16	0:32:09	0:02:53	0:01:23
Redwood City Station	0:32:31	0:35:35	0:03:04	0:01:34
San Carlos Station	0:35:40	0:38:44	0:03:04	0:01:34
Belmont Station	0:38:02	0:41:06	0:03:04	0:01:34
Hillsdale Station	0:40:44	0:43:49	0:03:05	0:01:35
Hayward Park Station	0:43:01	0:46:05	0:03:04	0:01:34
San Mateo Station	0:45:25	0:48:30	0:03:05	0:01:35
Burlingame Station	0:48:00	0:51:04	0:03:04	0:01:34
Broadway Station	0:50:05	0:53:11	0:03:06	0:01:36
Millbrae Station	0:52:47	0:55:54	0:03:07	0:01:37
San Bruno Station	0:56:08	0:59:14	0:03:06	0:01:36
South SF Station	0:58:58	1:02:05	0:03:07	0:01:37
Bayshore Station	1:04:00	1:07:06	0:03:06	0:01:36
22nd Street Station	1:08:10	1:11:16	0:03:06	0:01:36
4th & King Station	1:13:31	1:16:38	0:03:07	0:01:37

Table 2 – Minimum Supportable Caltrain Corridor CBOSS PTC Headway - Southbound Trains

Station	Lead	Following	Headway	Running Delay to Following Train
4th & King Station	0:00:00	0:01:30	0:01:30	0:00:00
22nd Street Station	0:04:44	0:07:48	0:03:04	0:01:34
Bayshore Station	0:08:59	0:12:03	0:03:04	0:01:34
South SF Station	0:13:57	0:17:01	0:03:04	0:01:34
San Bruno Station	0:16:51	0:19:55	0:03:04	0:01:34
Millbrae Station	0:20:10	0:23:15	0:03:05	0:01:35
Broadway Station	0:22:52	0:25:56	0:03:04	0:01:34
Burlingame Station	0:25:06	0:28:10	0:03:04	0:01:34
San Mateo Station	0:27:35	0:30:39	0:03:04	0:01:34
Hayward Park Station	0:29:58	0:33:02	0:03:04	0:01:34
Hillsdale Station	0:32:16	0:35:20	0:03:04	0:01:34
Belmont Station	0:34:58	0:38:03	0:03:05	0:01:35
San Carlos Station	0:37:19	0:40:23	0:03:04	0:01:34
Redwood City Station	0:40:27	0:43:32	0:03:05	0:01:35
Atherton Station	0:43:44	0:46:48	0:03:04	0:01:34
Menlo Park Station	0:45:55	0:49:00	0:03:05	0:01:35
Palo Alto Station	0:48:16	0:51:21	0:03:05	0:01:35
California Ave. Station	0:50:56	0:54:00	0:03:04	0:01:34
San Antonio Station	0:54:11	0:57:16	0:03:05	0:01:35
Mountain View Station	0:57:09	1:00:13	0:03:04	0:01:34
Sunnyvale Station	1:00:42	1:03:48	0:03:06	0:01:36
Lawrence Station	1:03:54	1:07:00	0:03:06	0:01:36
Santa Clara Station	1:08:10	1:11:18	0:03:08	0:01:38
San Jose Diridon Station	1:13:38	1:16:46	0:03:08	0:01:38

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Table 3 – Simulation of Northbound Trains - With 3:15 Departing Headway

Station	Lead	Following	Headway	Running Delay to Following Train
San Jose Diridon Station	0:00:00	0:03:15	0:03:15	0:00:00
Santa Clara Station	0:04:44	0:07:59	0:03:15	0:00:00
Lawrence Station	0:09:06	0:12:21	0:03:15	0:00:00
Sunnyvale Station	0:12:19	0:15:34	0:03:15	0:00:00
Mountain View Station	0:15:51	0:19:06	0:03:15	0:00:00
San Antonio Station	0:18:47	0:22:02	0:03:15	0:00:00
California Ave. Station	0:22:02	0:25:17	0:03:15	0:00:00
Palo Alto Station	0:24:45	0:28:00	0:03:15	0:00:00
Menlo Park Station	0:27:05	0:30:20	0:03:15	0:00:00
Atherton Station	0:29:16	0:32:31	0:03:15	0:00:00
Redwood City Station	0:32:31	0:35:46	0:03:15	0:00:00
San Carlos Station	0:35:40	0:38:55	0:03:15	0:00:00
Belmont Station	0:38:02	0:41:17	0:03:15	0:00:00
Hillsdale Station	0:40:44	0:43:59	0:03:15	0:00:00
Hayward Park Station	0:43:01	0:46:16	0:03:15	0:00:00
San Mateo Station	0:45:25	0:48:40	0:03:15	0:00:00
Burlingame Station	0:48:00	0:51:15	0:03:15	0:00:00
Broadway Station	0:50:05	0:53:21	0:03:16	0:00:01
Millbrae Station	0:52:47	0:56:02	0:03:15	0:00:00
San Bruno Station	0:56:08	0:59:23	0:03:15	0:00:00
South SF Station	0:58:58	1:02:13	0:03:15	0:00:00
Bayshore Station	1:04:00	1:07:15	0:03:15	0:00:00
22nd Street Station	1:08:10	1:11:25	0:03:15	0:00:00
4th & King Station	1:13:31	1:16:47	0:03:16	0:00:01

Table 4 – Simulation of Southbound Trains With 3:15 Departing Headway

Station	Lead	Following	Headway	Running Delay to Following Train
4th & King Station	0:00:00	0:03:15	0:03:15	0:00:00
22nd Street Station	0:04:44	0:07:59	0:03:15	0:00:00
Bayshore Station	0:08:59	0:12:14	0:03:15	0:00:00
South SF Station	0:13:57	0:17:12	0:03:15	0:00:00
San Bruno Station	0:16:51	0:20:06	0:03:15	0:00:00
Millbrae Station	0:20:10	0:23:25	0:03:15	0:00:00
Broadway Station	0:22:52	0:26:07	0:03:15	0:00:00
Burlingame Station	0:25:06	0:28:21	0:03:15	0:00:00
San Mateo Station	0:27:35	0:30:50	0:03:15	0:00:00
Hayward Park Station	0:29:58	0:33:13	0:03:15	0:00:00
Hillsdale Station	0:32:16	0:35:31	0:03:15	0:00:00
Belmont Station	0:34:58	0:38:13	0:03:15	0:00:00
San Carlos Station	0:37:19	0:40:34	0:03:15	0:00:00
Redwood City Station	0:40:27	0:43:42	0:03:15	0:00:00
Atherton Station	0:43:44	0:46:59	0:03:15	0:00:00
Menlo Park Station	0:45:55	0:49:10	0:03:15	0:00:00
Palo Alto Station	0:48:16	0:51:31	0:03:15	0:00:00
California Ave. Station	0:50:56	0:54:11	0:03:15	0:00:00
San Antonio Station	0:54:11	0:57:26	0:03:15	0:00:00
Mountain View Station	0:57:09	1:00:24	0:03:15	0:00:00
Sunnyvale Station	1:00:42	1:03:57	0:03:15	0:00:00
Lawrence Station	1:03:54	1:07:09	0:03:15	0:00:00
Santa Clara Station	1:08:10	1:11:26	0:03:16	0:00:01
San Jose Diridon Station	1:13:38	1:16:54	0:03:16	0:00:01

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Figure 5. Time-Distance "String" Chart Showing Northbound and Southbound All-Stops Trains Dispatched at Initial 1:30 Headway

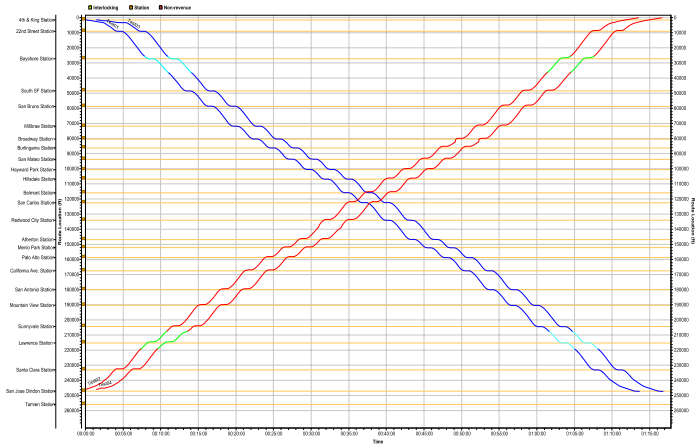
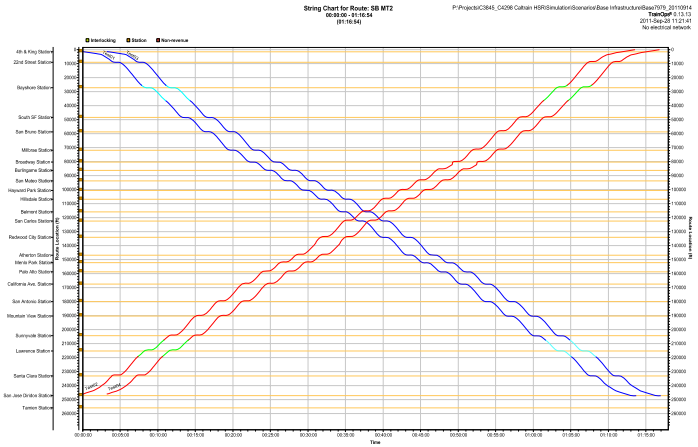


Figure 6. Time-Distance "String" Chart Showing Northbound and Southbound All-Stops Trains Operating on 3:15 Headway



3.3 Rolling Stock

The performance attributes of the future Caltrain and high speed rail vehicles (rolling stock) are detailed below. The specific attributes of each rolling stock type were modeled individually in the simulation, with differences affecting both acceleration and braking rates.

3.3.1 Caltrain

Caltrain is planning to replace its diesel fleet with electric trains called Electric Multiple Units (EMU). EMUs feature individual electric motors on the axles of each car, providing superior acceleration, greater reliability and a smoother ride than the current Caltrain diesel fleet. Commuter railroads in Chicago, New York, New Jersey, Philadelphia and Montreal use EMUs for high capacity, high performance operations. Caltrain is planning to use 8 car trains to augment the seating capacity of an existing 5 car train. EMU performance is based on preliminary specification documents and appropriate derating to reflect engineer conservatism:

- Initial acceleration (0 to 19 MPH) is 1.87 MPHPS with declining acceleration rates at higher velocities based on the tractive effort curve shown in Figure 7,
- Brake rate for station stops (with or without near side grade crossing enforcement) is 1.8 MPHPS,
- Brake rate for signal at stop or stop & proceed is 1.2 MPHPS, and
- Brake rate for civil speed enforcement is 1.2 MPHPS.

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The full service brake rate of the future Caltrain EMU is 2.5 MPHPS. The lower 1.2 and 1.8 MPHPS deceleration rates used in the simulation reflect the enforcement effects of CBOSS PTC as well as engineer conservatism.

Figure 8 displays the acceleration versus velocity curve for the Caltrain EMU, based on performance on level, tangent track. Acceleration at low velocities (up to about 20 MPH) is about 2.1 MPHPS. Table 5 presents the important physical and performance characteristics of the Caltrain Coradia Trainset as simulated in the Blended Operations Analysis.

Figure 7. Alstom Coradia Tractive Effort Curve, Representative of Caltrain EMU Performance

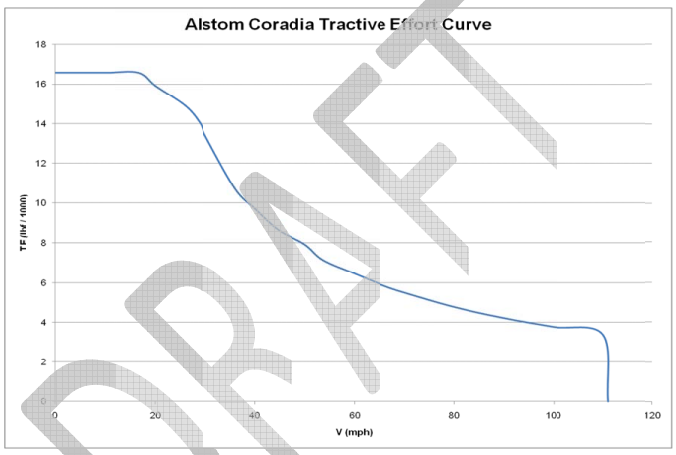
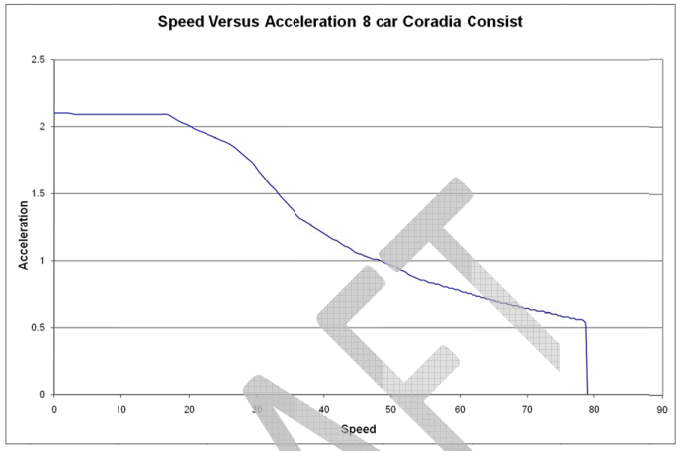


Table 5 – Caltrain Coradia Trainset Physical Characteristics

Description	Value	Unit	Value	Unit	Notes
Frontal Area	13.41	m^2	144.344	ft^2	
Length	213.2	M	699.5	Ft	
Empty Weight	517396	Kg	1140663	Lbs	
Design Deceleration	1.1176	m/s^2	2.50	MPHPS	
Braking Distance	1082.04	M	3550	Ft	3550 ft. from 110-0 mph.
Open Air Resistance	0.4100	$N/(kph^{2)}$	0.2387	lbf/mph^2	AAR Equation.
Maximum Operating Acceleration	0.939	m/s^2	2.1	MPHPS	2.1 MPHPS
Maximum Operating Deceleration	0.894	m/s^2	2.0	MPHPS	2.0 MPHPS

Figure 8. Speed versus Acceleration for Simulated Caltrain EMU



3.3.2 High Speed Rail

The high speed rail trains are based on Siemens "Velaro E" HSR performance data as follows:

- Initial acceleration (0 to 19 MPH) is 1.05 MPHPS with declining acceleration rates at higher velocities, as shown in Figure 9,
- Brake rate for station stops (with or without near side grade crossing enforcement) is 1.5 MPHPS,
- Brake rate for signal at stop or stop & proceed is 1.2 MPHPS, and
- Brake rate for civil speed enforcement is 1.2 MPHPS.

As with the future Caltrain EMU, the full service braking capability of the high speed rail trains is planned to be about 2.5 MPHPS. The lower 1.2 and 1.5 MPHPS deceleration rates used in the simulations reflect the enforcement effects of the CBOSS PTC system, as well as engineer caution.

Table 6 presents the important physical and performance characteristics of the Siemens "Velaro E" High Speed Trainset. The length of a high speed rail trainset used in the simulations is 656 feet (200 meters). The CHSRA has indicated that as ridership demand warrants, the length of the high speed rail trainsets are planned to increase in length up to 1,312 feet (400 meters).

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Figure 9. Siemens Velaro E High Speed Trainset Tractive Effort Curve

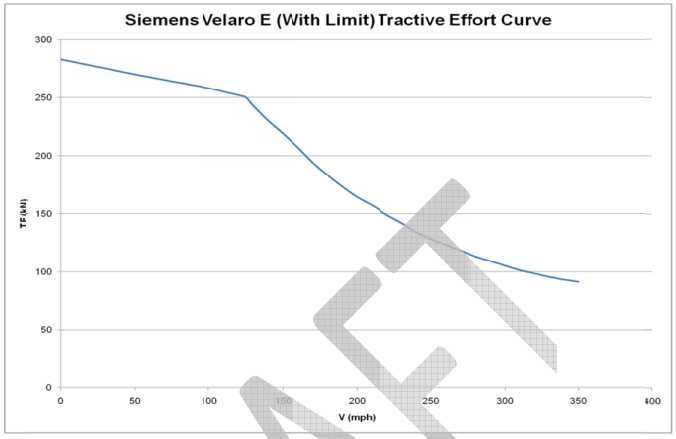
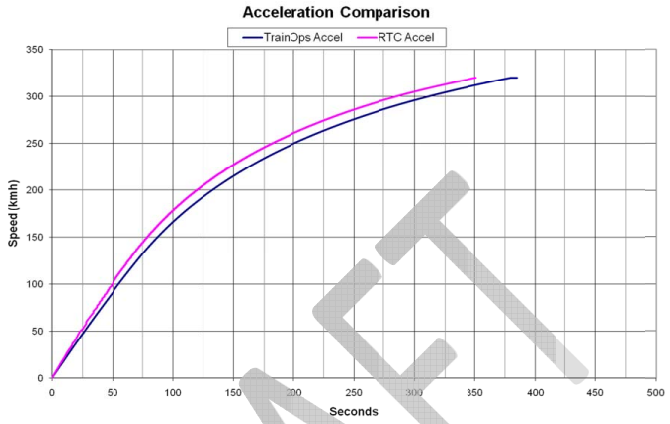


Table 6 – Siemens Velaro E High Speed Trainset Physical Characteristics

Description	Value	Unit	Value	Unit	Notes
Frontal Area	11.4755	m^2	123.521	ft^2	
Length	200	M	656.2	Ft	
Empty Weight	439000	Kg	967829	lbs	
Design Deceleration	0.94	m/s^2	2.10	MPHPS	
Braking Distance	3901.34	M	12800	Ft	Spec: 3900 m from 320-0 km/h
Open Air Resistance	0.02895	$N/(m^2kph^2)$	0.02895	$lbf/(ft^2mph^2)$	Davis Equation.
Maximum Operating Acceleration	1.1176	m/s^2	2.5	MPHPS	2.5 MPHPS
Maximum Operating Deceleration	0.6706	m/s^2	1.5	MPHPS	1.5 MPHPS

Side-by-side comparison of HSR acceleration using LTK's TrainOps software and the HSR Team's Rail Traffic Controller software was conducted to ensure consistency of results and to confirm that TrainOps is accurately modeling the high performance (low aerodynamic drag) attributes of HSR trainsets. The comparative results of a close correlation between the two independent software applications are demonstrated in Figure 10.

Figure 10. TrainOps and RTC Simulated Accelerations of Siemens Velaro E High Speed Trainset



3.4 Dispatching

3.4.1 Train Priorities

In general, the simulations naturally processed the trains in timetable order, giving priority to trains scheduled earlier versus trains scheduled later at a given interlocking. In rare cases, a Caltrain trip that closely follows high speed rail at Millbrae would request a route at the leaving end of Millbrae Station, effectively trying to overtake high speed rail in this short section of 3rd and 4th main track. Because of the Caltrain Corridor minimum supportable headways and the 30 second route reestablishment time, this dispatching would result in a two to four minute delay to high speed rail which was assumed to be unacceptable. These simulations were revised to reflect strict processing in timetable order, with no overtakes permitted in either direction at Millbrae.

3.4.2 Station "Hold Out Rule"

At stations specified in the Employee Timetable, Caltrain Operating Rule 6.30 (Rule 6.30) calls for the engineers of two trains approaching a station (with at least one of the trains making a station stop) to coordinate via radio to assure that only one train is in the station at a time. This "hold out" rule is applied at locations where passengers must cross one active track at grade in order to board and alight from trains.

In the model, the following stations, reflective of today's conditions, are assumed to be subject to Rule 6.30 "hold out" operations:

- South San Francisco,
- Broadway,
- Atherton.

The hold out rule applies equally to HSR and Caltrain trips on the Corridor. Where two trains are approaching one of the Rule 6.30 stations at about the same time and one of the trains is not stopping, that train was given priority in the simulation and passed through first. Where both trains are approaching the station and both are stopping, the first train approaching was allowed to enter the station first. The hold out rule does not apply if both approaching trains are passing through the station without stopping.

3.5 Operations

3.5.1 Caltrain

The assumed future Caltrain service plan used in the simulation is six trains per peak hour per direction and two trains per hour off-peak hour per direction. Today, Caltrain operates five trains per peak hour per direction.

The future operating concept serves all Caltrain stations. In contrast with the current operating plan, the Caltrain future operating concept tested in simulation includes no programmed overtakes.

This tested service plan represents only one possible plan. Other operating concepts for future operations will be considered and no official decision has been made with respect to future service levels, dispatching strategies (programmed overtakes), stopping patterns or scheduled trip times.

The Caltrain operating concept that was modeled uses peak period skip stop zone express service strategy, with station stop frequency based on ridership from that location. High ridership stations like Redwood City and Palo Alto receive six trains per hour per direction service, with these locations not only accommodating strong boarding ridership but also serving as transfer points for passengers traveling between two lower ridership stations not served by the same train.

The enhanced performance of the planned EMUs, when compared with the current diesel push-pull performance given the proposed service plan, supports San Francisco-San Jose trip times comparable to the current "Baby Bullet" service.

Table 7 shows a representative 60 minute period of the Caltrain future operating concept in the northbound direction while Table 8 shows the same information for southbound operations. The scheduled times in the tables reflect leaving times, except at the last station.

Table 7 – Peak 60 Minutes Northbound Service - AM Simulated Schedule

	416	418	420	422	424	426
Tamien Station		7:02a			7:32a	
San Jose Diridon Station	7:00a	7:10a	7:20a	7:30a	7:40a	7:50a
College Park Station*						
Santa Clara Station	7:05a			7:35a		
Lawrence Station		7:18a			7:48a	
Sunnyvale Station	7:11a	7:21a	7:30a	7:41a	7:51a	8:00a
Mountain View Station	7:16a	7:26a	7:35a	7:46a	7:56a	8:05a
San Antonio Station			7:38a			8:08a
California Ave. Station	7:21a			7:51a		
Palo Alto Station	7:25a	7:34a	7:44a	7:55a	8:04a	8:14a
Menlo Park Station		7:36a	7:46a		8:06a	8:16a
Atherton Station	7:28a					
Redwood City Station	7:32a	7:43a	7:51a	8:01a	8:13a	8:21a
San Carlos Station			7:54a			8:24a
Belmont Station		7:47a			8:17a	
Hillsdale Station	7:39a	7:50a	7:58a	8:08a	8:20a	8:28a
Hayward Park Station			8:00a			
San Mateo Station	7:42a	7:53a		8:11a	8:23a	
Burlingame Station		7:56a			8:26a	
Broadway Station				8:15a		
Millbrae Station	7:50a	8:01a	8:08a	8:19a	8:31a	8:37a
San Bruno Station			8:12a			8:41a
South SF Station	7:57a			8:26a		
Bayshore Station						8:45a
22nd Street Station			8:19a			
4th & King Station	8:04a	8:14a	8:23a	8:33a	8:44a	8:52a

*Schedule to be determined

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Table 8 – Peak 60 Minutes Southbound Service – AM Simulated Schedule

	417	419	421	423	425	427
4th & King Station	7:00a	7:10a	7:20a	7:30a	7:40a	7:50a
22nd Street Station	7:05a	7:15a	7:25a	7:35a	7:45a	7:55a
Bayshore Station		7:19a				
South SF Station				7:43a		
San Bruno Station		7:27a			7:56a	
Millbrae Station	7:18a	7:30a	7:38a	7:49a	7:59a	8:08a
Broadway Station						8:11a
Burlingame Station		7:34a			8:03a	
San Mateo Station		7:37a	7:44a		8:06a	8:15a
Hayward Park Station		7:39a				
Hillsdale Station	7:27a	7:42a		7:58a	8:10a	
Belmont Station			7:49a			8:20a
San Carlos Station	7:30a	7:45a		8:01a	8:13a	
Redwood City Station		7:51a	7:56a		8:19a	8:27a
Atherton Station					8:22a	
Menlo Park Station	7:39a		8:00a	8:10a		8:31a
Palo Alto Station	7:42a	7:57a	8:03a	8:13a	8:26a	8:34a
California Ave. Station			8:06a			8:37a
San Antonio Station	7:47a			8:18a		
Mountain View Station	7:51a	8:05a	8:12a	8:22a	8:34a	8:43a
Sunnyvale Station			8:16a			8:47a
Lawrence Station	7:57a			8:28a		
Santa Clara Station	8:02a			8:33a		
College Park Station*						
San Jose Diridon Station	8:07a	8:18a	8:29a	8:38a	8:47a	9:00a
Tamien Station	10:53a		11:53a		12:53p	

*Schedule to be determined

Table 9 displays a representative sample of the Caltrain operating concept for the off peak for northbound service. Trains operate on half-hourly "clockface" or "memory" schedules, with all trains serving all stations. Every other train serves Tamien.

Table 10 displays the same information for off-peak southbound operations. Scheduled times between San Jose Diridon and Tamien are shorter during off-peak operations than during peak operations due to the need for less schedule recovery during off-peak periods.

Table 9 – Northbound Service – Midday Simulated Schedule

	448	450	452	454	456	458
Tamien Station		11:27a		12:27p		1:27p
San Jose Diridon Station	11:00a	11:30a	12:00p	12:30p	1:00p	1:30p
College Park Station*						
Santa Clara Station	11:05a	11:35a	12:05p	12:35p	1:05p	1:35p
Lawrence Station	11:09a	11:39a	12:09p	12:39p	1:09p	1:39p
Sunnyvale Station	11:12a	11:42a	12:12p	12:42p	1:12p	1:42p
Mountain View Station	11:17a	11:47a	12:17p	12:47p	1:17p	1:47p
San Antonio Station	11:20a	11:50a	12:20p	12:50p	1:20p	1:50p
California Ave. Station	11:23a	11:53a	12:23p	12:53p	1:23p	1:53p
Palo Alto Station	11:27a	11:57a	12:27p	12:57p	1:27p	1:57p
Menlo Park Station	11:29a	11:59a	12:29p	12:59p	1:29p	1:59p
Atherton Station	11:31a	12:01p	12:31p	1:01p	1:31p	2:01p
Redwood City Station	11:35a	12:05p	12:35p	1:05p	1:35p	2:05p
San Carlos Station	11:38a	12:08p	12:38p	1:08p	1:38p	2:08p
Belmont Station	11:40a	12:10p	12:40p	1:10p	1:40p	2:10p
Hillsdale Station	11:43a	12:13p	12:43p	1:13p	1:43p	2:13p
Hayward Park Station	11:45a	12:15p	12:45p	1:15p	1:45p	2:15p
San Mateo Station	11:47a	12:17p	12:47p	1:17p	1:47p	2:17p
Burlingame Station	11:50a	12:20p	12:50p	1:20p	1:50p	2:20p
Broadway Station	11:52a	12:22p	12:52p	1:22p	1:52p	2:22p
Millbrae Station	11:56a	12:26p	12:56p	1:26p	1:56p	2:26p
San Bruno Station	12:00p	12:30p	1:00p	1:30p	2:00p	2:30p
South SF Station	12:04p	12:34p	1:04p	1:34p	2:04p	2:34p
Bayshore Station	12:05p	12:35p	1:05p	1:35p	2:05p	2:35p
22nd Street Station	12:09p	12:39p	1:09p	1:39p	2:09p	2:39p
4th & King Station	12:13p	12:43p	1:13p	1:43p	2:13p	2:43p

*Schedule to be determined

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Table 10 – Southbound Service – Midday Simulated Schedule

	449	451	453	455	457	459
4th & King Station	11:00a	11:30a	12:00p	12:30p	1:00p	1:30p
22nd Street Station	11:05a	11:35a	12:05p	12:35p	1:05p	1:35p
Bayshore Station	11:09a	11:39a	12:09p	12:39p	1:09p	1:39p
South SF Station	11:14a	11:44a	12:14p	12:44p	1:14p	1:44p
San Bruno Station	11:18a	11:48a	12:18p	12:48p	1:18p	1:48p
Millbrae Station	11:21a	11:51a	12:21p	12:51p	1:21p	1:51p
Broadway Station	11:24a	11:54a	12:24p	12:54p	1:24p	1:54p
Burlingame Station	11:26a	11:56a	12:26p	12:56p	1:26p	1:56p
San Mateo Station	11:29a	11:59a	12:29p	12:59p	1:29p	1:59p
Hayward Park Station	11:31a	12:01p	12:31p	1:01p	1:31p	2:01p
Hillsdale Station	11:34a	12:04p	12:34p	1:04p	1:34p	2:04p
Belmont Station	11:36a	12:06p	12:36p	1:06p	1:36p	2:06p
San Carlos Station	11:38a	12:08p	12:38p	1:08p	1:38p	2:08p
Redwood City Station	11:44a	12:14p	12:44p	1:14p	1:44p	2:14p
Atherton Station	11:47a	12:17p	12:47p	1:17p	1:47p	2:17p
Menlo Park Station	11:49a	12:19p	12:49p	1:19p	1:49p	2:19p
Palo Alto Station	11:52a	12:22p	12:52p	1:22p	1:52p	2:22p
California Ave. Station	11:55a	12:25p	12:55p	1:25p	1:55p	2:25p
San Antonio Station	11:58a	12:28p	12:58p	1:28p	1:58p	2:28p
Mountain View Station	12:02p	12:32p	1:02p	1:32p	2:02p	2:32p
Sunnyvale Station	12:06p	12:36p	1:06p	1:36p	2:06p	2:36p
Lawrence Station	12:09p	12:39p	1:09p	1:39p	2:09p	2:39p
Santa Clara Station	12:14p	12:44p	1:14p	1:44p	2:14p	2:44p
College Park Station*						
San Jose Diridon Station	12:19p	12:49p	1:19p	1:49p	2:19p	2:49p
Tamien Station		12:53p		1:53p		2:53p

*Schedule to be determined

To ensure conservative simulation results, all trains were simulated with a full seated load of 948 passengers (for an 8-car EMU) between all stations.

3.5.2 High Speed Rail

Based on CHSRA input, 4th and King, Millbrae and Diridon stations were assumed to be the three HSR station stops on the Corridor. Millbrae allows convenient connections to BART and the San Francisco International Airport. A two minute dwell time for HSR trains at Millbrae was assumed.

Short of having a high speed rail schedule, the operating plan assumed uniform scheduled headways, which will support "memory" type schedules. Peak period HSR volumes were subject to significant variation in the simulation scenarios, ranging from one to four HSR trains per hour per direction. An off-peak service level of two HSR trains per hour per direction was assumed.

3.5.3 Other Rail Services

In addition to Caltrain and California HSR, Capitol Corridor and ACE trains were modeled in the extreme southern portion of the Corridor between Santa Clara and San Jose Diridon stations. Additional analysis will be conducted separate from this report to assess future higher service planned by Capitol Corridor and ACE. It will also include assessing the compatibility of existing corridor freight services with the blended operations concept.

3.5.4 Schedule Margin

Schedule margin (sometimes referred to as "pad" or "recovery allowance") is a standard rail scheduling practice to provide for operating variability, maintenance tolerances, longer dwell times due to inclement weather, wheelchair and bike boardings, temporary speed restrictions and other operating variables. An industry standard six percent schedule margin was applied to all train operations, including both interstation run times and dwells.

This margin was enforced as part of the actual train performance, rather than by enforcing train wait times at stations. In other words, the simulation derated acceleration, maximum speed and deceleration such that the result of each simulated interstation run was six percent longer than the corresponding best possible simulation result without schedule margin.

3.5.5 Simulation Duration

Simulations were processed from 4 AM to 1 PM, effectively testing the morning peak period, transitions to and from the morning peak period and a representative three hour off-peak period.

3.5.6 Dwell Times and Randomization

LTK conducted extensive field observations in May of 2011 to quantify the variability in current Caltrain dwell times and to establish averages at each station served. These are shown in Table 11. The field observations were sorted so that only dwells when the train was behind schedule were used in the statistical analysis in order to ensure that no "hold for time" component of dwell time is represented in the statistics.

Current dwell times are based largely on two passenger streams per Caltrain Gallery Car. Future EMUs will support four passenger streams (two double leaf doors at each end of each side of the vehicle), effectively doubling both the passenger boarding and alighting capacity. In order to predict future EMU dwell times, the May 2011 dwell time observations were broken into two parts – "base" dwell time and passenger flow time. The "base" dwell time reflects door open time, door close time, conductor-engineer communication time and train response time to begin moving. The "base" dwell time was assumed to be 17 seconds based on generally accepted industry standards.

LTK subtracted the "base" dwell time from the May 2011 field observations. Because the passenger flow rate doubles with EMUs, the passenger time of the remaining portion of the dwell observations was cut in half. Finally, the "base" dwell time was added back in to the result used in the simulations. As an example, the Mountain View 2011 field observation average was 64 seconds; the future simulation dwell is 41 seconds. Table 12 shows the simulated dwell time averages, minima and maxima used in the simulations.

Table 11 – May 2011 Field Observations

	Average	Min	Max
22nd Street	0:00:51	0:00:33	0:01:21
Bayshore	0:00:55	0:00:28	0:01:55
Belmont	0:00:57	0:00:34	0:01:55
Burlingame	0:00:46	0:00:33	0:01:03
California Ave.	0:00:51	0:00:27	0:01:14
Hayward Park	0:00:40	0:00:30	0:00:52
Hillsdale	0:00:49	0:00:33	0:01:08
Lawrence	0:00:46	0:00:31	0:01:24
Menlo Park	0:00:55	0:00:34	0:01:38
Millbrae	0:00:53	0:00:42	0:01:04
Mountain View	0:01:04	0:00:47	0:01:47
Palo Alto	0:01:19	0:00:41	0:02:23
Redwood City	0:01:07	0:00:41	0:01:50
San Antonio	0:00:44	0:00:31	0:01:10
San Bruno	0:00:45	0:00:32	0:00:56
San Carlos	0:00:57	0:00:30	0:02:48
San Mateo	0:00:53	0:00:39	0:01:05
Santa Clara	0:00:51	0:00:30	0:01:51
South SF	0:00:53	0:00:32	0:01:55
Sunnyvale	0:01:00	0:00:34	0:01:51
Overall Average	0:00:54	0:00:34	0:01:34

Table 12 – Simulated Values with EMU Dwell Time Improvements (Includes 6% Schedule Margin)

	Average	Min	Max
22nd Street	0:00:36	0:00:36	0:01:01
Bayshore	0:00:47	0:00:33	0:01:19
Belmont	0:00:48	0:00:36	0:01:19
Burlingame	0:00:42	0:00:36	0:00:51
California Ave.	0:00:45	0:00:32	0:00:57
Hayward Park	0:00:39	0:00:34	0:00:46
Hillsdale	0:00:44	0:00:36	0:00:54
Lawrence	0:00:42	0:00:34	0:01:03
Menlo Park	0:00:47	0:00:36	0:01:10
Millbrae	0:00:46	0:00:40	0:00:52
Mountain View	0:00:52	0:00:43	0:01:15
Palo Alto	0:01:00	0:00:40	0:01:34
Redwood City	0:00:54	0:00:40	0:01:16
San Antonio	0:00:41	0:00:34	0:00:55
San Bruno	0:00:42	0:00:35	0:00:48
San Carlos	0:00:48	0:00:34	0:01:47
San Mateo	0:00:46	0:00:39	0:00:52
Santa Clara	0:00:45	0:00:34	0:01:17
South SF	0:00:46	0:00:35	0:01:19
Sunnyvale	0:00:50	0:00:36	0:01:17
Overall Average	0:00:46	0:00:36	0:01:08

Dwell times were randomized in the simulation based on the EMU dwell times shown above. As an example, dwell times for individual simulated trains at Palo Alto ranged from 40 seconds to 1:34 in the simulation with an average dwell time of 1:00.

No other types of simulation input, such as train dispatch times, interlocking route establishment times or vehicle performance, were randomized in the simulations.

3.5.7 Station Stop Types

All trains were dispatched at their scheduled times from their terminal locations in San Francisco and San Jose. "S" (hold for schedule) type stops were used at these locations to ensure schedule adherence. At all other locations, trains were simulated with "D" (depart when ready) stops, given the lack of specific Caltrain and HSR scheduled times at each station for each trip in each scenario.

4 Operations Analysis Results

Summary: This chapter describes the incremental approach that was followed in the development of the blended operations scenarios as well as the simulation results, organized by tested speed scenarios. The three tested speed scenarios were 79/79, 79/110 and 110/110 (Caltrain/HSR). Results are shown by each of the tested blended operations service level and include model outputs: travel time; signal delay; Caltrain service intervals (train headways); and assumed infrastructure.

4.1 Simulation Process

The simulation modeling results reflect the incremental approach in the development of the blended operations scenarios. The first results presented are the "6/0" scenarios (6 Caltrain and 0 HSR trains per peak hour per direction), then layered in additional HSR trains.

HSR frequencies were increased from an initial service level of 1 train per hour per direction ("6/1" scenarios) to up to 4 trains per hour ("6/4" scenarios, bringing total Corridor train volumes to 10 trains per hour per direction).

At the same, varying maximum operating speeds and assumed infrastructure were also tested, with each scenario changing only one variable (train volume, infrastructure or maximum operating speed) at a time so that the impact of the change could be precisely understood.

Where a simulated train volume in a given scenario resulted in unacceptable train congestion and delays for a given infrastructure and a given maximum operating speed, the follow-on simulation scenarios with higher train volumes appropriately included additional infrastructure or changes in maximum operating speeds to eliminate the unacceptable train congestion and delays.

This incremental "three dimensional matrix" of service level, maximum train speed and infrastructure produced a very large number of potential scenarios, which was limited to a number that could be simulated in a reasonable time by using the results of initial scenarios to guide the study team in identifying subsequent scenarios that showed promise blended operations having conceptual feasibility.

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Table 13 provides an at-a-glance chart that identifies the tested blended operations simulation scenarios. The infrastructure features are as described in Section 4.2 (79/79 mph scenarios), Section 4.3 (79/110 scenarios) and Section 4.4 (110/110 mph scenarios).

Five potential infrastructure overtake options were conceptually defined as described in Section 3.1.3. These include: North Overtake, Full Midline Overtake, Short Midline Overtake, South Overtake and a 3-track option.

Table 13 and the subsequent sections in this chapter focus on the Full and Short Midline Overtake options. Assessment of the remaining three infrastructure options (North Overtake, South Overtake and the 3-track option) will be completed and the results of those simulations will be presented in a subsequent report.

Caltrain/ HSR Trains per Hour per Direction	Infrastructure
79/79 Scenarios	
6/0	Baseline HSR Infrastructure
6/1	Baseline HSR Infrastructure
6/2	Baseline HSR Infrastructure
6/3	Baseline HSR Infrastructure
6/3	Full Midline 4 Track
6/4	Full Midline 4 Track
6/3	Short Midline 4 Track
6/4	Short Midline 4 Track
79/110 Scenarios	
6/3	Full Midline 4 Track
6/4	Full Midline 4 Track
6/3	Short Midline 4 Track
6/4	Short Midline 4 Track
110/110 Scenarios	
6/0	Baseline HSR Infrastructure
6/2	Baseline HSR Infrastructure
6/3	Baseline HSR Infrastructure
6/3	Full Midline 4 Track
6/4	Full Midline 4 Track
6/3	Short Midline 4 Track
6/4	Short Midline 4 Track

4.2 Analysis by Speed - 79/79 Scenarios

4.2.1 Without Overtake Tracks

The 79/79 simulations with Baseline Infrastructure (existing Caltrain ROW, HSR stations and no 3rd and 4th track for overtakes) were processed with peak period 6/0 (no HSR), 6/1, 6/2 and 6/3 Caltrain/HSR service levels.

To support HSR trains, the six peak hour Caltrain trips in each direction had to be clustered in order to create one or more "slots" for HSR. In the 6/2 scenario, clusters of three Caltrain trips followed by a HSR trip operated. In the 6/3 scenario, clusters of two Caltrain trips followed by a HSR trip operated.

This scheduling strategy can be seen graphically in the time-distance string charts shown in Figure 12 (6/1), Figure 13 (6/2) and Figure 14 (6/3). These three figures should be contrasted with the time-distance string chart shown in Figure 11 which shows the nearly uniform 10-minute Caltrain headways in each direction of the 6/0 scenario. All string charts are included in Appendix A.

Closer headways are required (and are supported by the planned CBOSS PTC system) between Caltrain trips as the number of HSR trains on the corridor increases. HSR trains are unable to operate for the length of the corridor without ending up behind a stopping Caltrain trip. The delays to HSR trains are most severe in the off-peak periods where Caltrain operates all-stop trains.

For the 6/1 and 6/2 Baseline Infrastructure scenarios, the delays do not cause problems for Caltrain service, but do increase the average travel time for HSR service. Increasing the number of HSR trains to three per hour per direction (the 6/3 Baseline Infrastructure scenario) begins to cause cascading delays to Caltrain service during the peak period. Caltrain trips delay HSR trips that, in turn, delay following Caltrain trips. The 6/3 Baseline Infrastructure scenario is operating beyond the practical capacity of the corridor and not a viable option.

4.2.2 With Overtake Tracks

With North Overtake Tracks

The simulation of the North Overtake segment found that the Bayshore to Millbrae four station segment had difficulty supporting the required 7+ minute travel time difference A major contributing factor to the lack of a 7+ minute travel time difference at the North Overtake is the fact that HSR trains will stop at Millbrae Station and will require a longer dwell (estimated to be 2 minutes) than Caltrain due to fewer doors per car and the need to accommodate passengers with luggage.

A significant number of additional Caltrain stops at Bayshore, South San Francisco and San Bruno stations that presently have low ridership would be required in order

to accomplish reliable overtakes. The simulation results showed increased trip times for Caltrain passengers and a less effective overtake location for HSR than the Full Midline Overtake due to increasing maximum waiting times for Caltrain trains due to less regular service intervals than the Full Midline Overtake.

Because of these initial results, that may be unacceptable to Caltrain, further study of the North Overtake section and its tangible operating impacts to Caltrain and HSR service was deferred, to be considered at a later phase of this study.

With Full Midline Overtake Tracks

Many of the operating difficulties of the Baseline Infrastructure simulation scenarios are eliminated under the 79/79 scenarios with the Hayward Park to Redwood City Midline Overtake (the Full Midline Overtake). With HSR trains able to overtake Caltrain trips, the required gaps between Caltrain trips for HSR do not need to be as large. HSR trains can effectively make use of twice the Caltrain headway over the length of the corridor (gaining on one Caltrain trip before the Midline Overtake and the previous Caltrain trip after the Midline Overtake).

For example, a Caltrain service gap at Palo Alto of 19 minutes is required in the 79/79 6/2 Baseline Infrastructure scenario, whereas the maximum service gap there in the 79/79 6/2 Midline Overtake scenario is just 11 minutes. Even when HSR service is increased to the 79/79 6/4 service level, the Midline Overtake scenario limits the maximum Palo Alto Caltrain time between trains to 14 minutes.

Almost all of the delay to HSR trains is eliminated in the scenarios with up to three HSR trains per hour. Under the 6/4 scenario with Midline Overtake scenario, the delays are manageable with little negative impact on average travel time.

With Short Midline Overtake Tracks

The 79/79 scenario results using the shorter Hayward Park to Whipple Avenue Midline Overtake show that many of the operational advantages of the full Midline Overtake are achieved, but more significant changes to Caltrain service are necessary for delay-free operation. Since there is less distance in which the HSR overtake of Caltrain can occur, all overtaken trains must stop at a minimum of three of the four stations within the overtake trackage for delay-free operation.

The absence of Redwood City Station – where all Caltrain trips are scheduled to stop in the future operating plan simulated – in the shorter Midline Overtake scenarios makes the operation significantly more challenging. The addition of new scheduled stops for overtaken Caltrain trips has the effect of increasing the average Caltrain travel time in the short Midline Overtake scenarios. See Appendix A, Tables 20 and 21, for the northbound and southbound operating plan changes required in order to obtain reliable operations for the short version of the Midline Overtake during peak periods.

Simulation Results

Table 14 and Table 15 below detail the simulation results for each of the 79/79 scenarios with separate statistics for Caltrain and for HSR. The statistics reflect overall averages for all of the trains operating during the morning peak period.

For Caltrain, all scenarios support an average San Jose to San Francisco simulated trip time of 59 to 61 minutes, with most train trips arriving 2 to 3 minutes ahead of schedule. Signal delay reflects the number of minutes and seconds that the total population of simulated trains (morning peak period and midday) is operating at reduced speed or stopped because of congestion ahead. When divided by the number of peak period Caltrain trips (36), the per-train delays are quite modest. Only the 6/3 Baseline Infrastructure scenario signal delay is of concern, as it reflects some cascading delays of Caltrain delaying HSR and HSR then delaying Caltrain.

Table 14 – Caltrain Simulation Results
Speed: 79/79 (Caltrain/HSR)

Caltrain/ HSR Service Level	Trip Times (H:M:S)	Signal Delay (H:M:S)	Caltrain Peak Hour Service Intervals (at Palo Alto NB) (Minutes)	Infrastructure Assumed in Simulation
6/0	0:59:53	0:02:12	10/9/11/9/9/12	Baseline HSR Infrastructure
6/1	0:59:56	0:01:44	10/5/7/17/9/12	Baseline HSR Infrastructure
6/2	0:59:56	0:02:49	19/5/7/17/5/7	Baseline HSR Infrastructure
6/3	0:59:58	0:11:03	5/15/6/13/5/16	Baseline HSR Infrastructure
6/3	0:59:58	0:01:00	12/6/12/9/11/10	Full Midline 4 Track
6/4	1:00:13	0:01:36	6/14/10/4/14/12	Full Midline 4 Track
6/3	1:00:13	0:05:12	14/5/14/7/15/5	Short Midline 4 Track
6/4	1:00:41	0:02:45	6/9/15/5/10/15	Short Midline 4 Track

For HSR, San Francisco to San Jose simulated trip times shown in Table 15 range from 45 to 49 minutes with the 6/3 Baseline Infrastructure scenario having an average trip time a minute longer than the next highest average trip time scenario. Again, this points to the significant congestion in that scenario, as evidenced by the more than 90 minutes of total signal delay experienced by the 18 HSR trains operating in that scenario during the peak period.

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Table 15 – HSR Simulation Results
Speed: 79/79 (Caltrain/HSR)

Caltrain/ HSR Service Level	Trip Times (H:M:S)	Signal Delay (H:M:S)	Infrastructure Assumed in Simulation
6/1	0:47:56	0:20:33	Baseline HSR Infrastructure
6/2	0:46:37	0:20:59	Baseline HSR Infrastructure
6/3	0:48:56	1:34:10	Baseline HSR Infrastructure
6/3	0:45:14	0:17:01	Full Midline 4 Track
6/4	0:45:51	0:29:14	Full Midline 4 Track
6/3	0:44:50	0:02:13	Short Midline 4 Track
6/4	0:45:20	0:16:48	Short Midline 4 Track

4.3 Analysis by Speed - 79/110 Scenarios

The 79/110 scenarios are identical to the 79/79 scenarios except that HSR trains are permitted to operate at up to 110 MPH (where supported by track geometry) in the overtake segments and up to 79 MPH outside of the overtake segments. By definition, 79/110 scenarios exist only with overtake infrastructure.

In the 79/110 overtake simulations, the results were much the same as the 79/79 simulation scenarios with the largest difference being the enhanced reliability of the overtake and a correspondingly lower number of stops required for overtaken trains.

The ability of HSR trains to operate at up to 110 MPH in the overtake areas produced more reliable overtakes than under the comparable 79/79 scenario. The faster average HSR travel time over the corridor required a small number of stops to be exchanged between trips approaching the terminals, moving stops from a Caltrain trip being followed by an HSR trip to a train that had been overtaken.

Table 16 presents the Caltrain simulation statistics for the 79/110 scenarios. Caltrain trip times are virtually identical to the 79/79 scenarios as there is no change in those trains' maximum authorized speeds. Signal delay for all scenarios is virtually zero on a per-train basis. The longest intervals between trains, as measured at Palo Alto northbound (NB), are 14 minutes (in the 6/4 full Midline Overtake and the 6/3 Short Midline Overtake), which is only a small increase over the 12 minute interval experienced in the 6/0 Baseline Infrastructure scenario.

Table 16 – Caltrain Simulation Results
Speed: 79/110 (Caltrain/HSR - Only on Overtake Track)

Caltrain/ HSR Service Level	Trip Times (H:M:S)	Signal Delay (H:M:S)	Caltrain Peak Hour Service Intervals (at Palo Alto NB) (Minutes)	Infrastructure Assumed in Simulation
6/3	0:59:57	0:03:47	12/7/13/7/11/10	Full Midline 4 Track
6/4	0:59:52	0:06:07	5/12/12/5/12/14	Full Midline 4 Track
6/3	0:59:50	0:03:30	13/5/14/7/12/9	Short Midline 4 Track
6/4	1:00:11	0:00:00	7/11/12/6/11/13	Short Midline 4 Track

For HSR, the 110 MPH maximum operating speed (within the overtake trackage limits only) provides a modest travel time benefit. Whereas the 79/79 average simulated trip times range from 45 to 49 minutes, Table 17 indicates that the 79/110 average simulated trip times are all about 43 minutes for HSR trains (all HSR trip times include a two-minute stop at Millbrae and six percent schedule margin for the entire run). When measured on a per-train basis, no HSR train experiences more than one minute of signal delay on its San Francisco to San Jose trip.

Table 17 – HSR Simulation Results
Speed: 79/110 (Caltrain/HSR - Only on Overtake Track)

Caltrain/ HSR Service Level	Trip Times (H:M:S)	Signal Delay (H:M:S)	Infrastructure Assumed in Simulation
6/3	0:43:12	0:15:41	Full Midline 4 Track
6/4	0:43:14	0:18:39	Full Midline 4 Track
6/3	0:43:26	0:01:15	Short Midline 4 Track
6/4	0:43:51	0:18:02	Short Midline 4 Track

4.4 Analysis by Speed - 110/110 Scenarios

4.4.1 Without Overtake Tracks

For the 110/110 Baseline Infrastructure simulation with 6/0 service level (no HSR), the Caltrain 79/79 6/0 operating plan required significant changes to eliminate following move delays (a Caltrain trip delaying a following trip). Due to Caltrain's skip stop zone express schedule tested in the simulations, a train skipping a stop would often close in upon the preceding train on an alternate pattern. By adjusting the schedule patterns to keep the Caltrain trip times approximately equal, it was possible to eliminate all of this delay in the 110/110 6/0 scenario.

It should be noted that the higher speeds in the 110 mph simulation mean that a greater safe braking distance is required by the CBOSS PTC system than is the case under 79 MPH operation.

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The operating challenges with creating a delay-free Caltrain schedule under 6/0 carry over to the Baseline Infrastructure simulations with 6/2 and 6/3 levels of HSR service. With a much shorter trip time under a 110 MPH maximum speed, HSR trains close in on Caltrain trips faster than under the comparable 79/79 scenarios.

This has the effect of significantly increasing the total delay for HSR. The 6/2 Baseline Infrastructure HSR signal delay is more than 60 minutes of total delay for the entire group of simulated trains over the morning peak period (versus 21 minutes for the comparable scenario under 79/79).

4.4.2 With Full Midline Overtake Tracks

For the 110/110 Hayward Park to Redwood City Midline overtake simulations, the overtake itself was possible without delay. However, many schedule modifications to Caltrain trips were necessary to prevent delays before and after the overtake because of the pronounced travel time difference between HSR and Caltrain trips.

While no additional stops were necessary, schedule patterns were necessarily adjusted to keep overtaken trains running faster prior to the overtake and slower after the overtake. Similarly, trains that were not overtaken were made to run slower prior to the overtake and faster thereafter, strategies to keep from delaying HSR trains. See Appendix A, Table 22 and Table 23, for the northbound and southbound operating plan changes that were required in order to obtain reliable operations for the 110/110 scenario during the peak periods.

4.4.3 With Short Midline Overtake Tracks

In the 110/110 Hayward Park to Whipple Avenue Midline Overtake simulation, the reduced overtake length required additional deviations from the original Caltrain schedule pattern in the southern half of the schedule. The increased two-track shared use corridor distance from Whipple Avenue to San Jose Diridon, makes it very difficult for a 110 mph train to leave San Jose without encountering delay prior to reaching the overtake, and for a southbound HSR train to keep from being delayed by the Caltrain train it follows after the overtake. Since all Caltrain trips stop at Redwood City, which is not part of the overtake, a northbound HSR train needs either a longer scheduled headway leaving San Jose or, if that is not possible, for the overtaken train to make fewer stops prior to the overtake.

4.4.4 Simulation Results

Table 18 and Table 19 below detail the simulation results for each of the 110/110 scenarios with separate statistics for Caltrain and for HSR. The statistics reflect overall averages for all of the trains operating during the morning peak period.

The Caltrain terminal-to-terminal trip times range from 56 to 57 minutes, a reduction of 3 to 4 minutes from the 79/79 simulation scenarios.

Table 18 – Caltrain Simulation Results
Speed: 110/110 (Caltrain/HSR)

Caltrain/ HSR Service Level	Trip Times (H:M:S)	Signal Delay (H:M:S)	Caltrain Peak Hour Service Intervals (at Palo Alto NB) (Minutes)	Infrastructure Assumed in Simulation
6/0	0:56:42	0:01:31	9/8/13/9/9/12	Baseline HSR Infrastructure
6/2	0:56:42	0:02:12	18/5/6/18/5/8	Baseline HSR Infrastructure
6/3	0:57:01	0:31:19	15/6/14/5/13/7	Baseline HSR Infrastructure
6/3	0:56:40	0:00:09	14/5/13/6/14/8	Full Midline 4 Track
6/4	0:56:27	0:02:36	5/11/14/4/12/14	Full Midline 4 Track
6/3	0:56:35	0:06:57	15/5/14/5/14/7	Short Midline 4 Track
6/4	0:56:31	0:01:01	5/11/14/4/11/15	Short Midline 4 Track

Table 19 – HSR Simulation Results
Speed: 110/110 (Caltrain/HSR)

Caltrain/ HSR Service Level	Trip Times (H:M:S)	Signal Delay (H:M:S)	Infrastructure Assumed in Simulation
6/2	0:41:30	1:04:03	Baseline HSR Infrastructure
6/3	0:43:35	2:15:12	Baseline HSR Infrastructure
6/3	0:37:24	0:10:17	Full Midline 4 Track
6/4	0:38:35	0:44:24	Full Midline 4 Track
6/3	0:38:02	0:19:50	Short Midline 4 Track
6/4	0:39:20	0:52:15	Short Midline 4 Track

The HSR San Francisco to San Jose trip times (with appropriate schedule margin and a two-minute stop at Millbrae included) are about 37 to 39 minutes in the 110/110 scenarios. This can be compared to the 45-48 minute range for the 79/79 scenarios, and to about 43 minutes in the 79/110 scenarios.

5 Conclusion

Based on the results of the TrainOps simulation model customized for application to the Caltrain and high speed rail operations analysis, a blended operation where Caltrain and high speed rail trains share tracks is conceptually feasible.

This report only addresses the finding that blended operations on the Caltrain Corridor are conceptually feasible. The report is not intended to define what the blended system is. It provides a "proof of concept" for a blended system in the Caltrain Corridor. Subsequent work to be completed includes: engineering, identifying maintenance needs, cost estimating, ridership forecasts and environmental clearance.

Assuming electrification with the CBOSS PTC system and EMU electric rail vehicles – a system with superior performance attributes from that of today's diesel-powered system – the Corridor can support up to 10 trains per peak hour per direction. This is double the train traffic that is being operated today.

The blended system with Caltrain scheduling strategies and no passing tracks can reliably support up to 6 Caltrain trains and 2 high speed rail trains per peak hour per direction. With additional overtake tracks, the blended system can support up to 6 Caltrain trains and 4 high speed rail trains per peak hour per peak direction.

If train speeds can be increased up to 110 mph, travel times can be reduced. High speed rail trains experience greater travel time savings. Caltrain trips, making more station stops than high speed rail (and therefore having fewer opportunities to attain maximum speed between station stops), would experience less travel time savings.

Building on this "proof of concept", there is more analysis to be done. Additional analysis will include completion of the overtake track options at various locations along the corridor and an assessment of alternative service plan/operations variables. These efforts will be conducted over the next several months and be used to further inform the definition of the blended system.

6 Appendix A – Caltrain Tested Schedule Modifications

Table 20 presents the northbound operating plan changes required in order to obtain reliable operations for the short version of the Midline Overtake during peak periods under the 6/4 79/79 scenario. In general, station stops were added to Caltrain trips, increasing overall trip time, in order to achieve the necessary minimum 7 minute travel time difference between HSR and Caltrain trips being overtaken. During the peak hour, a total of 5 additional Caltrain station stops – distributed across the 6 trains per hour in the simulation and not otherwise included in the future operating plan assumed for simulation -- is needed in the northbound direction to achieve reliable overtakes.

Table 20 – Revisions to AM Peak Hour Stopping Patterns of Tested Schedule to Accommodate 79/79 Hayward Park to Whipple Avenue (MP 24.3) Midline – Northbound

Caltrain trains:	416	418	420	422	424	426
Overtaken by HSR trains:		*HSR16*	*HSR18*		*HSR20*	*HSR22*
Tamien Station		•			•	
San Jose Diridon Station	•	•	•	•	•	•
College Park Station*						
Santa Clara Station	•			•		
Lawrence Station		•			•	
Sunnyvale Station	•	•	•	•	•	•
Mountain View Station	•	•	•	•	•	•
San Antonio Station			•			•
California Ave. Station	•			•		
Palo Alto Station	•	•	•	•	•	•
Menlo Park Station	O	X	•	O	X	•
Atherton Station	X		O			
Redwood City Station	•	•	•	•	•	•
San Carlos Station		O	•		O	•
Belmont Station		•	O		•	O
Hillsdale Station	•	•	•	•	•	•
Hayward Park Station			•			O
San Mateo Station	•	•	O	X	•	
Burlingame Station		•			•	
Broadway Station				•		
Millbrae Station	•	•	•	•	•	•
San Bruno Station			•			•
South SF Station	X	O		X	O	
Bayshore Station						•
22nd Street Station			•			
4th & King Station	•	•	•	•	•	•

X Station stop removed from originally-developed Caltrain operating plan to accommodate HSR.
• Station stop in originally-developed Caltrain operating plan that remains in 79/79 Hayward Park to Whipple Avenue Midline HSR scenarios.
O Station stop not in originally-developed Caltrain operating plan that was added to accommodate HSR.

*Schedule to be determined

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Table 21 presents the same information for the southbound direction for the 6/4 79/79 scenario with the Short Midline Overtake.

Table 21 – Revisions to AM Peak Hour Stopping Patterns of Tested Schedule to Accommodate 79/79 Hayward Park to Whipple Avenue (MP 24.3) Midline – Southbound

Caltrain trains:	417	419	421	423	425	427
Overtaken by HSR trains:	*HSR15*	*HSR17*		*HSR19*		*HSR21*
4th & King Station	•	•	•	•	•	•
22nd Street Station	•	•	•	•	•	•
Bayshore Station		•				
South SF Station				•		
San Bruno Station		•			•	
Millbrae Station	•	•	•	•	•	•
Broadway Station						X
Burlingame Station		•			•	
San Mateo Station	O	•	X	O	X	•
Hayward Park Station		•		O		
Hillsdale Station	•	•		•	•	
Belmont Station	O		•			•
San Carlos Station	•	•		•	X	O
Redwood City Station		•	•		•	•
Atherton Station					•	
Menlo Park Station	•		•	•		•
Palo Alto Station	•	•	•	•	•	•
California Ave. Station			•			•
San Antonio Station	•			•		
Mountain View Station	•	•	•	•	•	•
Sunnyvale Station			•			•
Lawrence Station	•			•		
Santa Clara Station	•			X	O	
College Park Station*						
San Jose Diridon Station	•	•	•	•	•	•
Tamien Station	•		•		•	

X Station stop removed from originally-developed Caltrain operating plan to accommodate HSR.
• Station stop in originally-developed Caltrain operating plan that remains in 79/79 Hayward Park to Whipple Avenue Midline HSR scenarios.
O Station stop not in originally-developed Caltrain operating plan that was added to accommodate HSR.
*Schedule to be determined

Table 22 shows how the initially tested Caltrain zone express skip stop operating plan was altered during the peak 60 minutes to accommodate the 110/110 scenario HSR operations with a minimum of following move delay to HSR in the northbound direction. Table 23 shows the same information for the southbound direction.

Table 22 – Revisions to AM Peak Hour Stopping Patterns of Tested Schedule to Accommodate 110/110 Hayward Park to Redwood City Midline – Northbound

Caltrain train:	416	418	420	422	424	426
Overtaken by HSR train:		*HSR16*	*HSR18*		*HSR20*	*HSR22*
Tamien Station		•			•	
San Jose Diridon Station	•	•	•	•	•	•
College Park Station*						
Santa Clara Station	•			•		
Lawrence Station		•			•	
Sunnyvale Station	•	•	•	•	•	•
Mountain View Station	•	•	•	•	•	•
San Antonio Station			•			•
California Ave. Station	•			•		
Palo Alto Station	•	•	•	•	•	•
Menlo Park Station		•	•		•	•
Atherton Station	•					
Redwood City Station	•	•	•	•	•	•
San Carlos Station			•			•
Belmont Station		•			•	
Hillsdale Station	•	•	•	•	•	•
Hayward Park Station			•			
San Mateo Station	X	•	O	X	•	O
Burlingame Station		•			•	
Broadway Station				X	O	
Millbrae Station	•	•	•	•	•	•
San Bruno Station			•			•
South SF Station	X	O		X	O	
Bayshore Station						•
22nd Street Station			•			
4th & King Station	•	•	•	•	•	•

X Station stop removed from originally-developed Caltrain operating plan to accommodate 110/110 HSR.
• Station stop in originally-developed Caltrain operating plan that remains in 110/110 HSR scenarios
O Station stop not in originally-developed Caltrain operating plan that was added to accommodate 110/110 HSR.
*Schedule to be determined

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

Table 23 – Revisions to AM Peak Hour Stopping Patterns of Tested Schedule to Accommodate 110/110 Hayward Park to Redwood City Midline – Southbound

Caltrain train:	417	419	421	423	425	427
Overtaken by HSR train:		*HSR15*	*HSR17*		*HSR19*	*HSR21*
4th & King Station	•	•	•	•	•	•
22nd Street Station	•	•	•	•	•	•
Bayshore Station		•				
South SF Station				•		
San Bruno Station		•			•	
Millbrae Station	•	•	•	•	•	•
Broadway Station						•
Burlingame Station		•			•	
San Mateo Station		•	•		•	•
Hayward Park Station		•				
Hillsdale Station	•	•		•	•	
Belmont Station			•			•
San Carlos Station	•	•		•	•	
Redwood City Station		•	•		•	•
Atherton Station					•	
Menlo Park Station	•		•	•		•
Palo Alto Station	•	•	•	•	•	•
California Ave. Station			•			•
San Antonio Station	•			•		
Mountain View Station	•	•	•	•	•	•
Sunnyvale Station			•			•
Lawrence Station	X	O		X	O	
Santa Clara Station	•			•		
College Park Station						
San Jose Diridon Station	•	•	•	•	•	•
Tamien Station	•		•		•	

X Station stop removed from originally-developed Caltrain operating plan to accommodate 110/110 HSR.

• Station stop in originally-developed Caltrain operating plan that remains in 110/110 HSR scenarios

O Station stop not in originally-developed Caltrain operating plan that was added to accommodate 110/110 HSR.

*Schedule to be determined

7 Appendix B – Time-Distance String Charts

Time-Distance String Chart Color Legend

- Northbound Caltrain Main Track
- Southbound Caltrain Main Track
- Northbound HSR Main Track Including Overtake Track
- Southbound HSR Main Track Including Overtake Track
- Existing Northbound Caltrain "Siding" Track at Lawrence and Bayshore
- Existing Southbound Caltrain "Siding" Track at Lawrence and Bayshore

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

7.1 Morning Peak Period

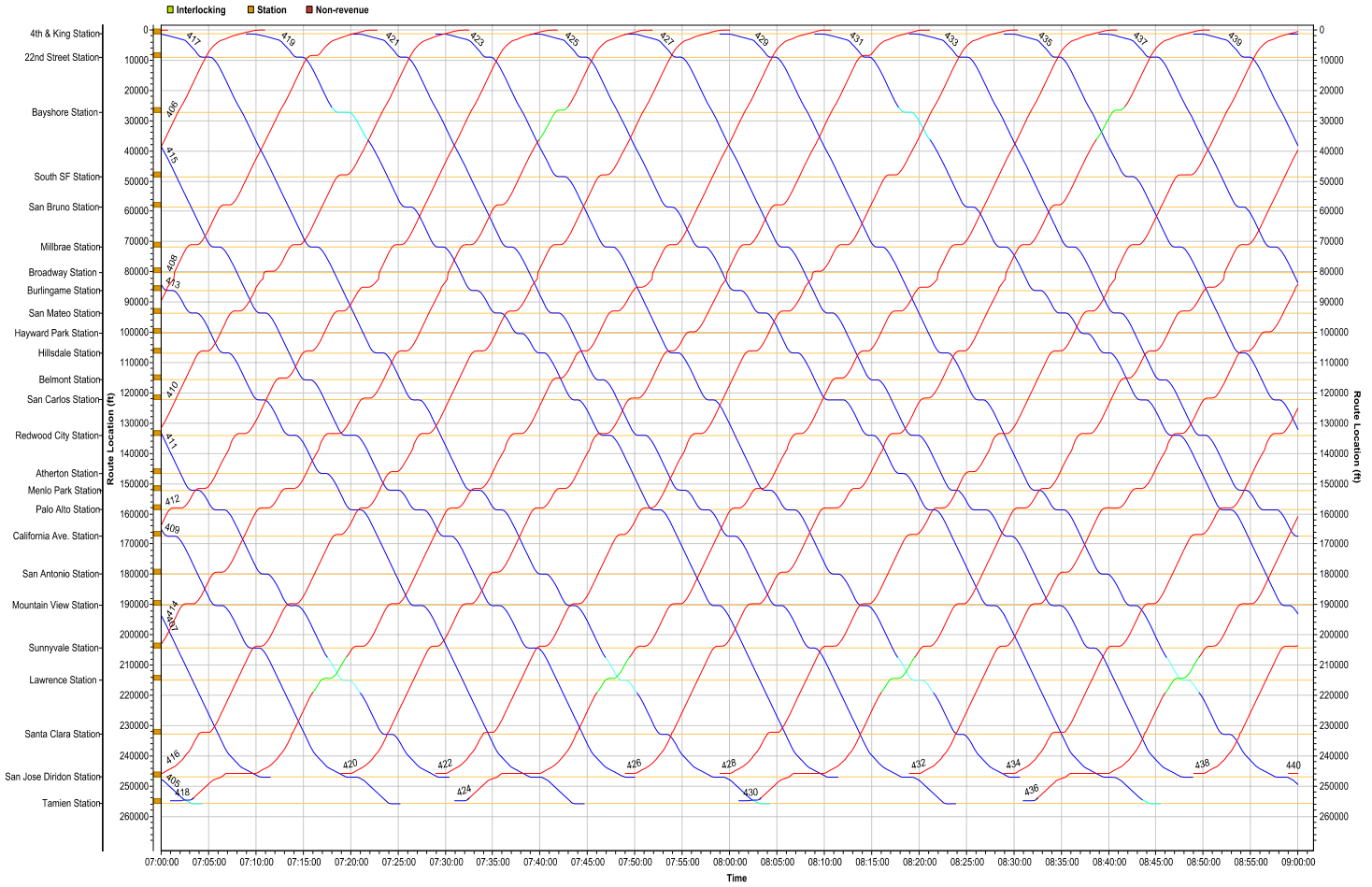


Figure 11. Time-Distance "String" Chart – 7 to 9 AM - 79/79 Baseline Infrastructure 0 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

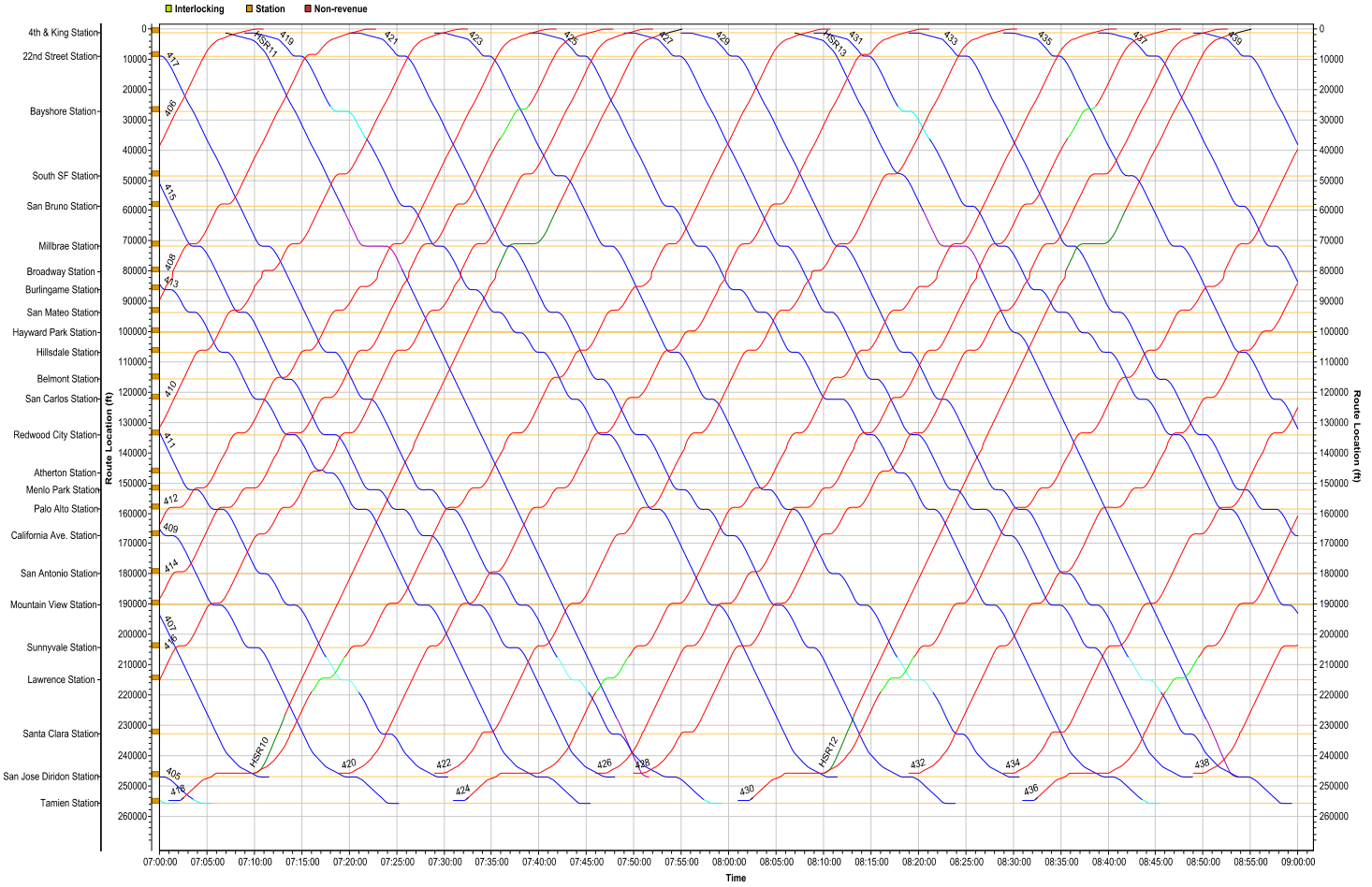


Figure 12. Time-Distance "String" Chart – 7 to 9 AM - 79/79 Baseline Infrastructure 1 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

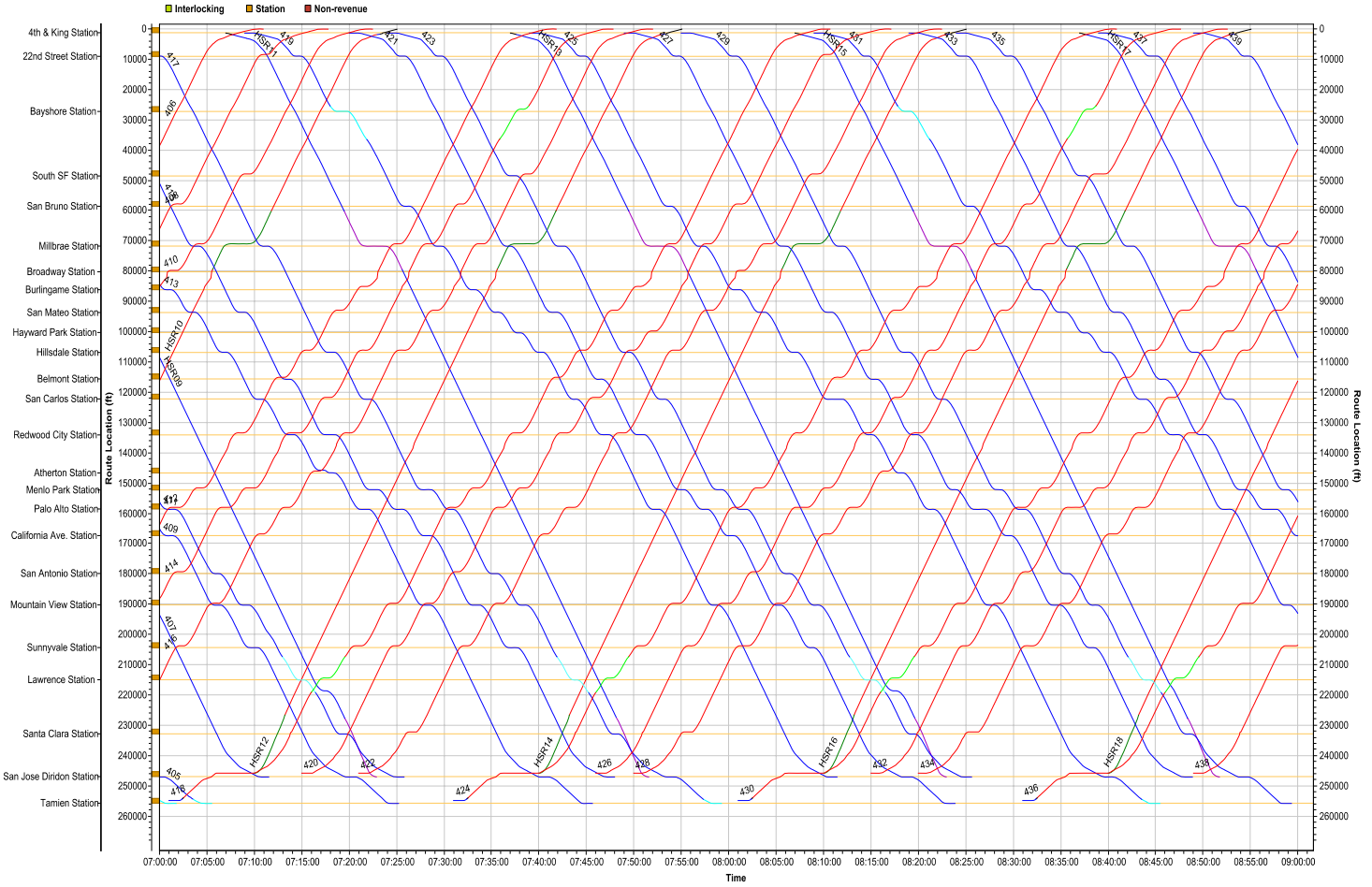


Figure 13. Time-Distance "String" Chart – 7 to 9 AM - 79/79 Baseline Infrastructure 2 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

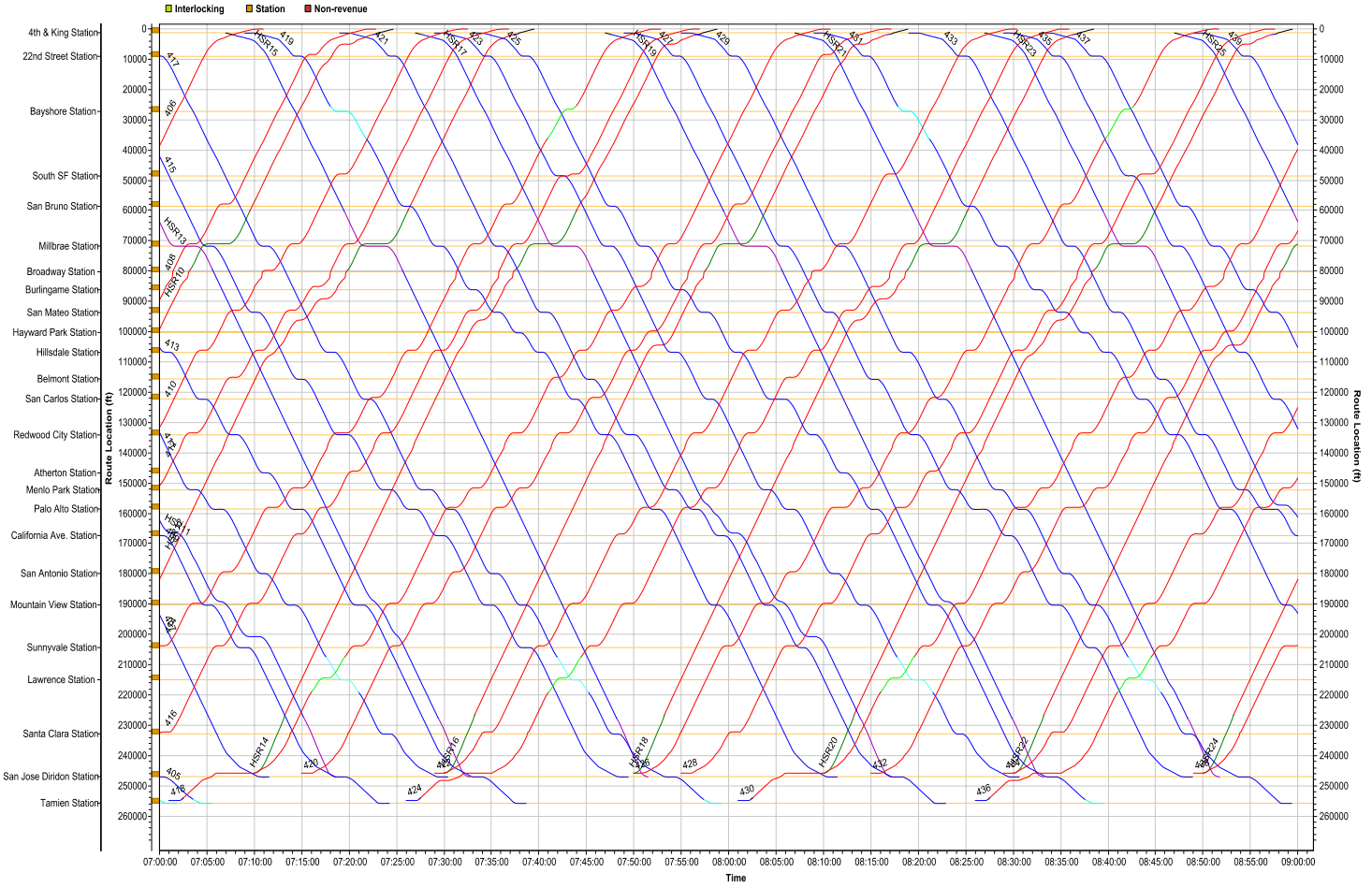


Figure 14. Time-Distance "String" Chart – 7 to 9 AM - 79/79 Baseline Infrastructure 3 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

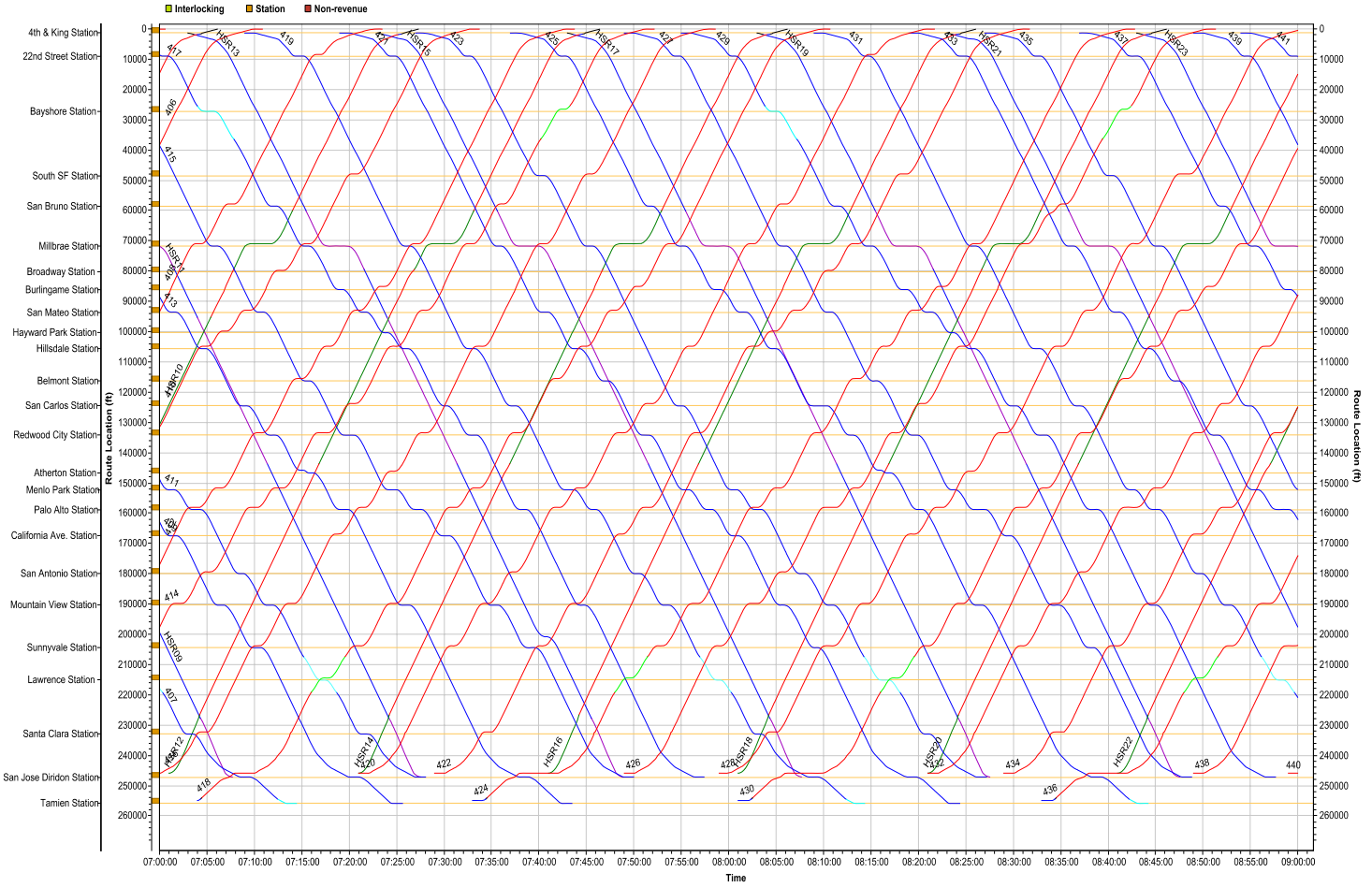


Figure 15 Time-Distance "String" Chart – 7 to 9 AM - 79/79 Full Midline Overtake 3 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

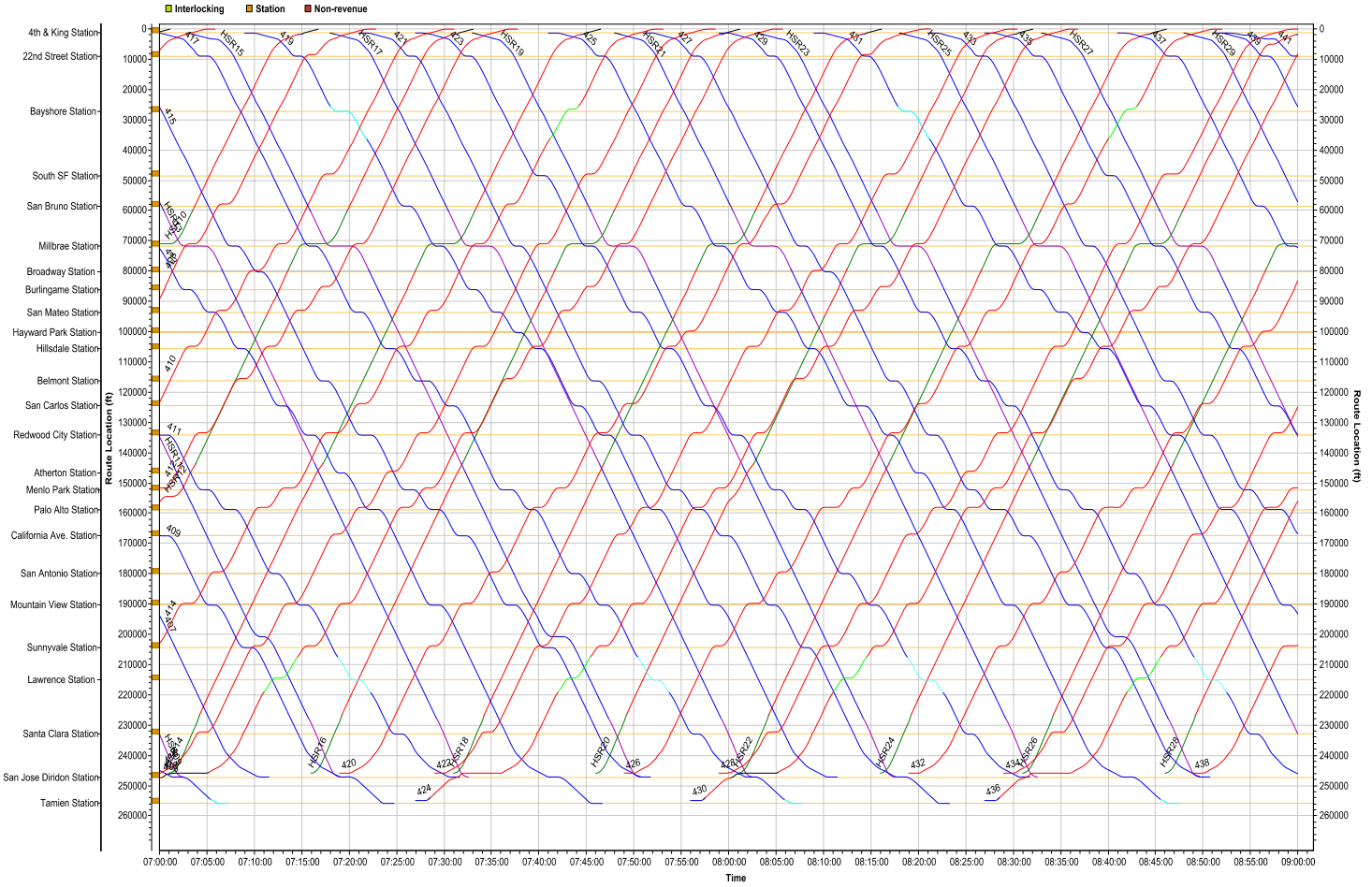


Figure 16. Time-Distance "String" Chart – 7 to 9 AM - 79/79 Full Midline Overtake 4 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

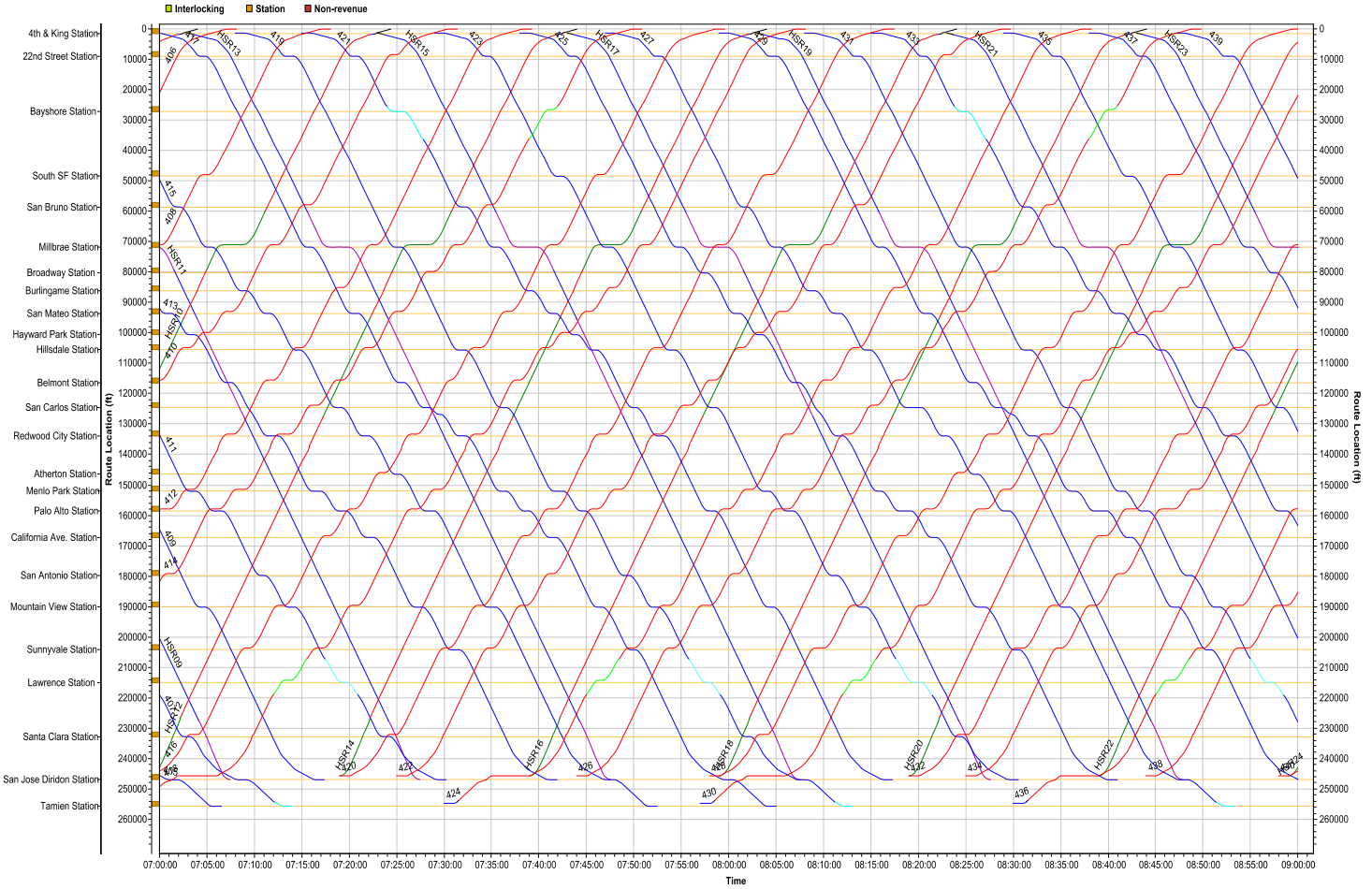


Figure 17. Time-Distance "String" Chart – 7 to 9 AM - 79/79 Short Midline Overtake 3 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

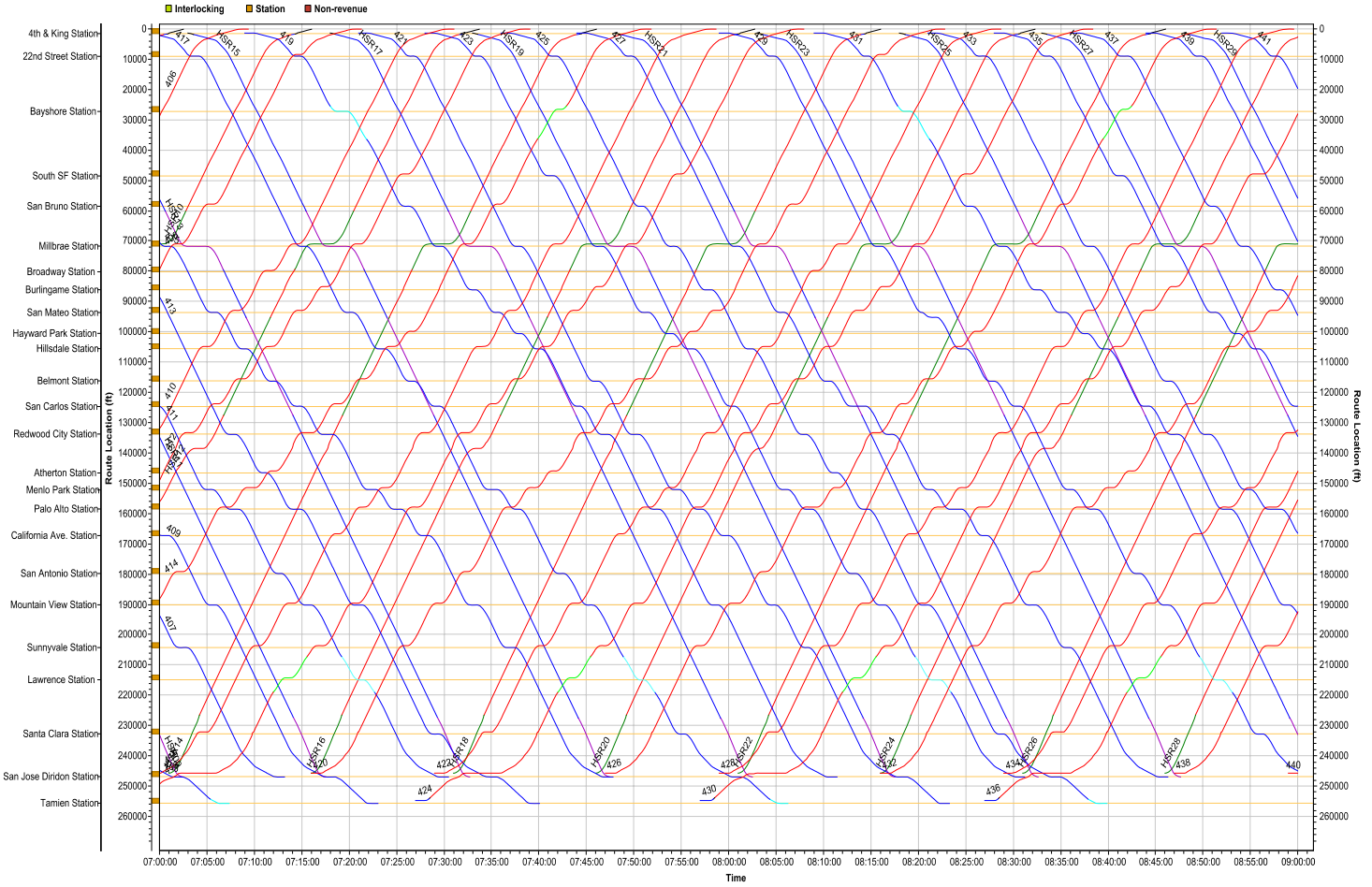


Figure 18. Time-Distance "String" Chart – 7 to 9 AM - 79/79 Short Midline Overtake 4 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

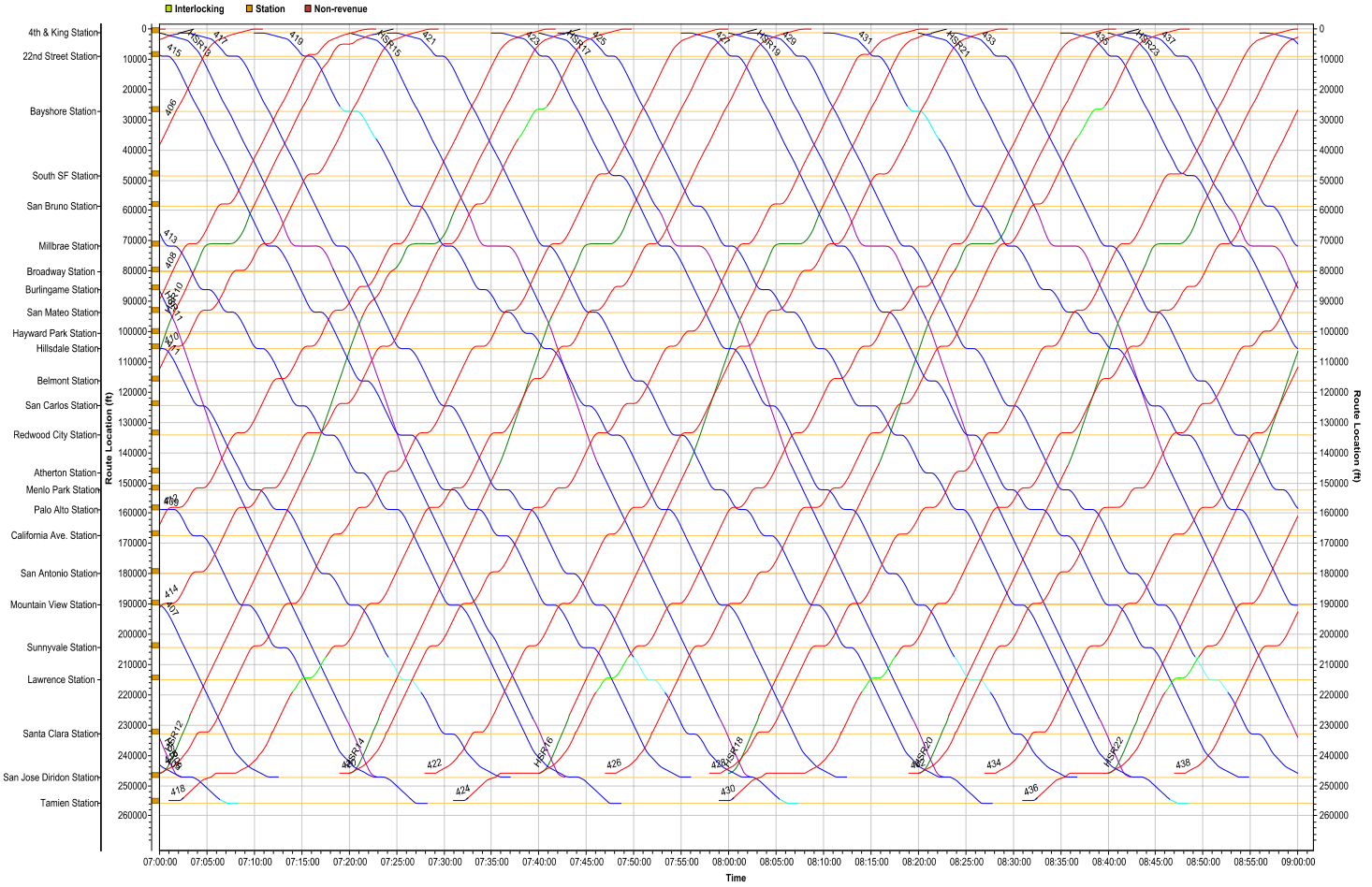


Figure 19. Time-Distance "String" Chart – 7 to 9 AM - 79/110 Full Midline Overtake 3 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

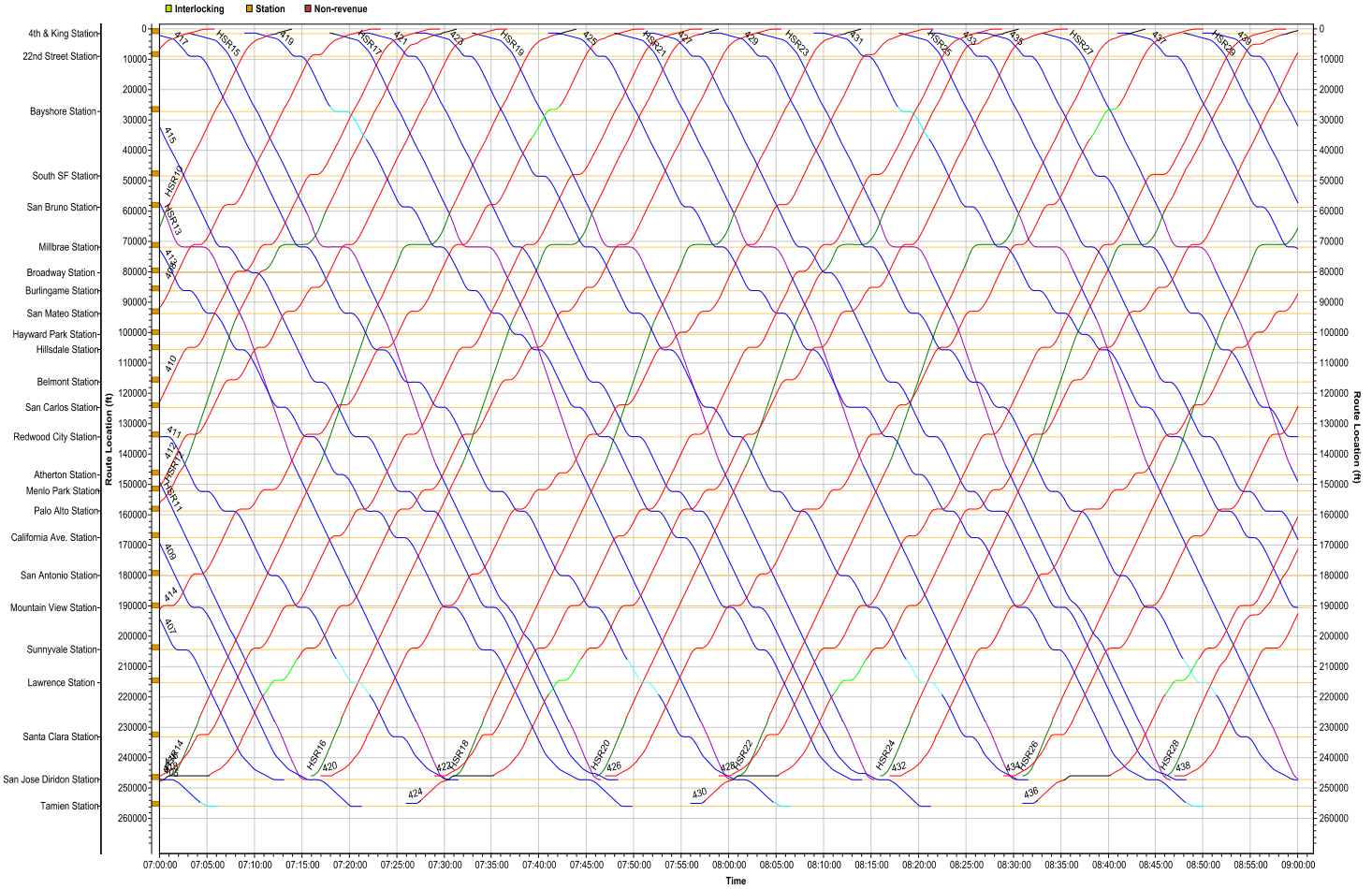


Figure 20. Time-Distance "String" Chart – 7 to 9 AM - 79/110 Full Midline Overtake 4 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

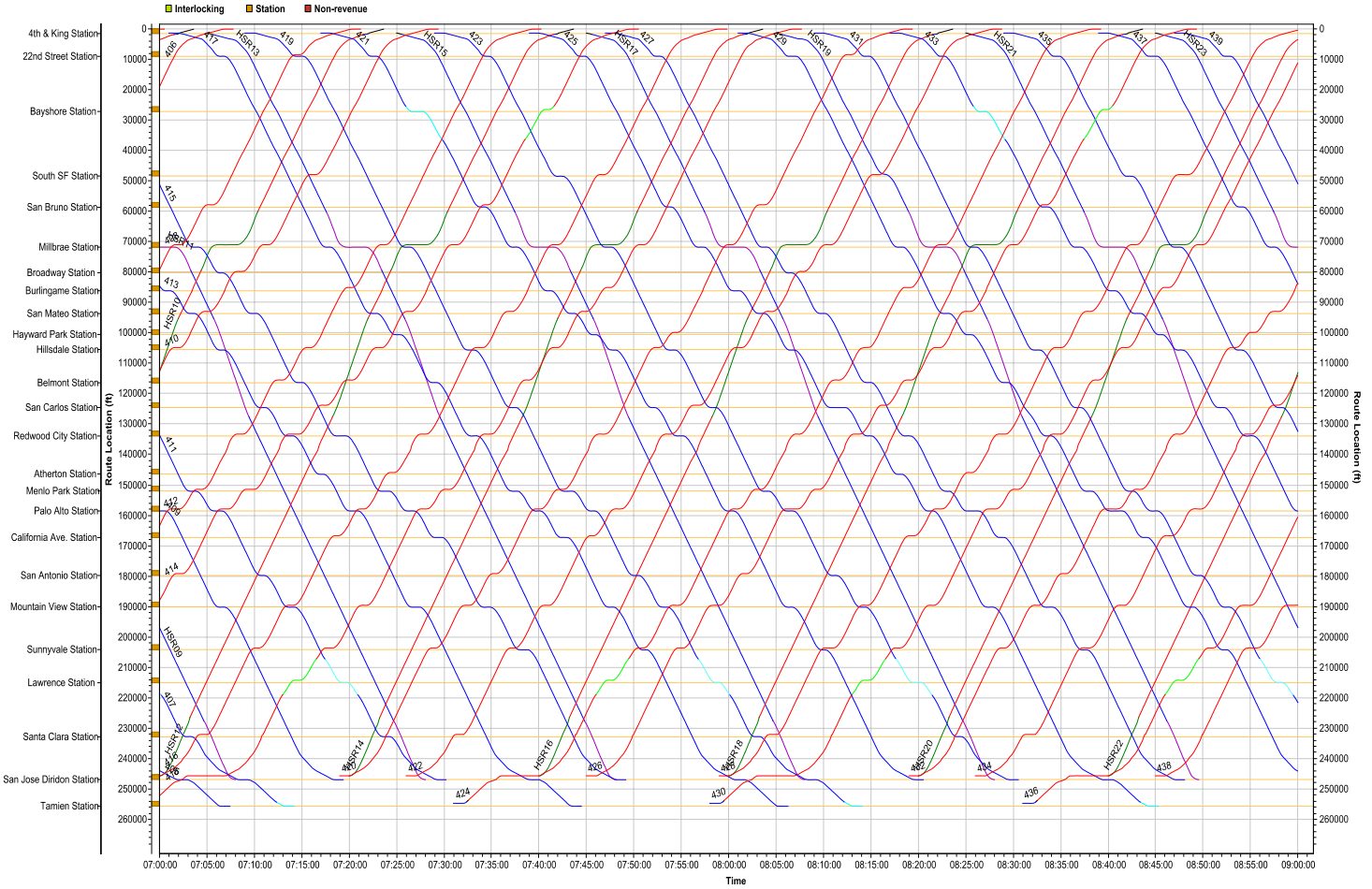


Figure 21. Time-Distance "String" Chart – 7 to 9 AM - 79/110 Short Midline Overtake 3 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

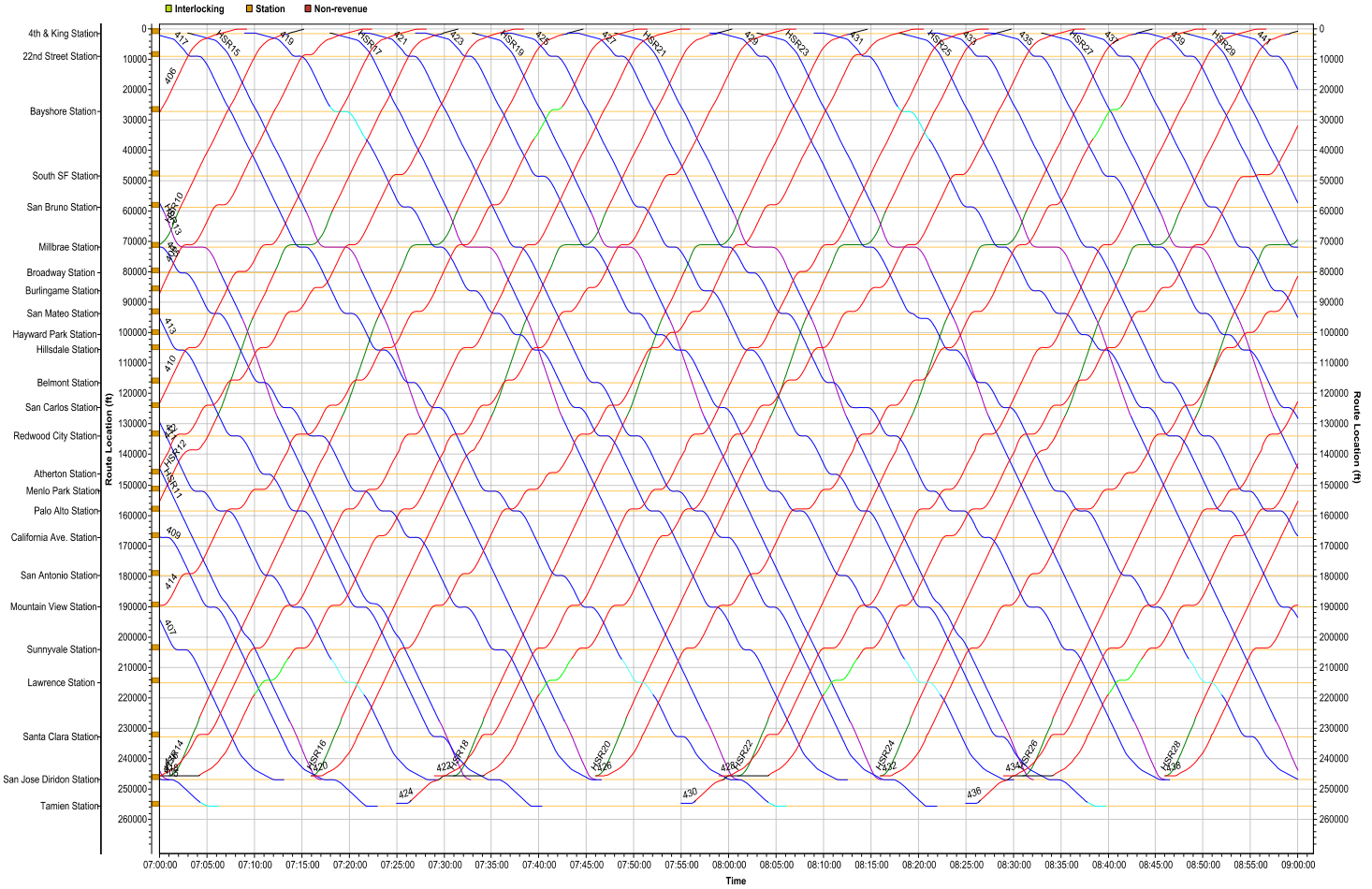


Figure 22. Time-Distance "String" Chart – 7 to 9 AM - 79/110 Short Midline Overtake 4 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

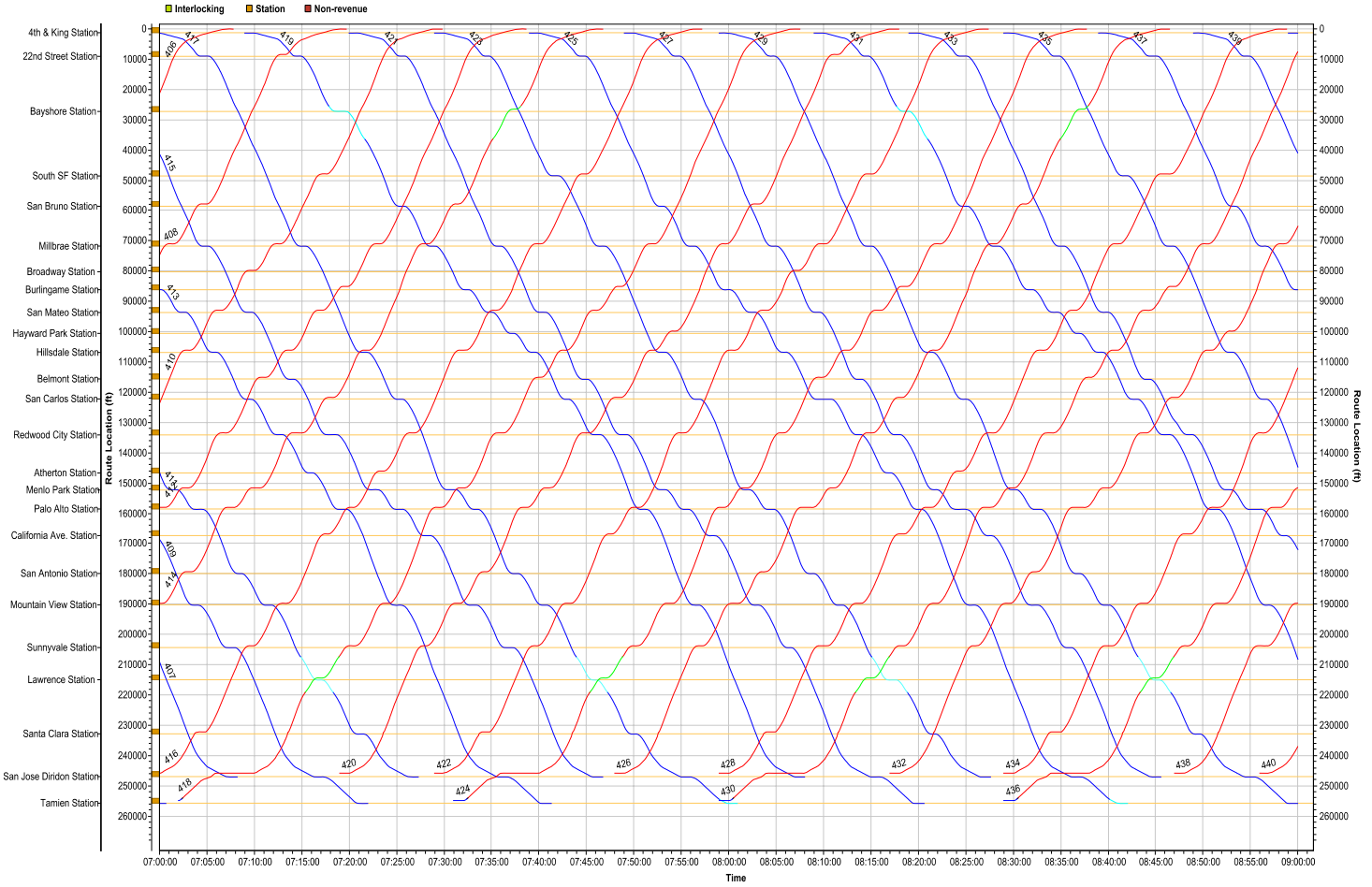


Figure 23. Time-Distance "String" Chart – 7 to 9 AM - 110/110 Baseline Infrastructure 0 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

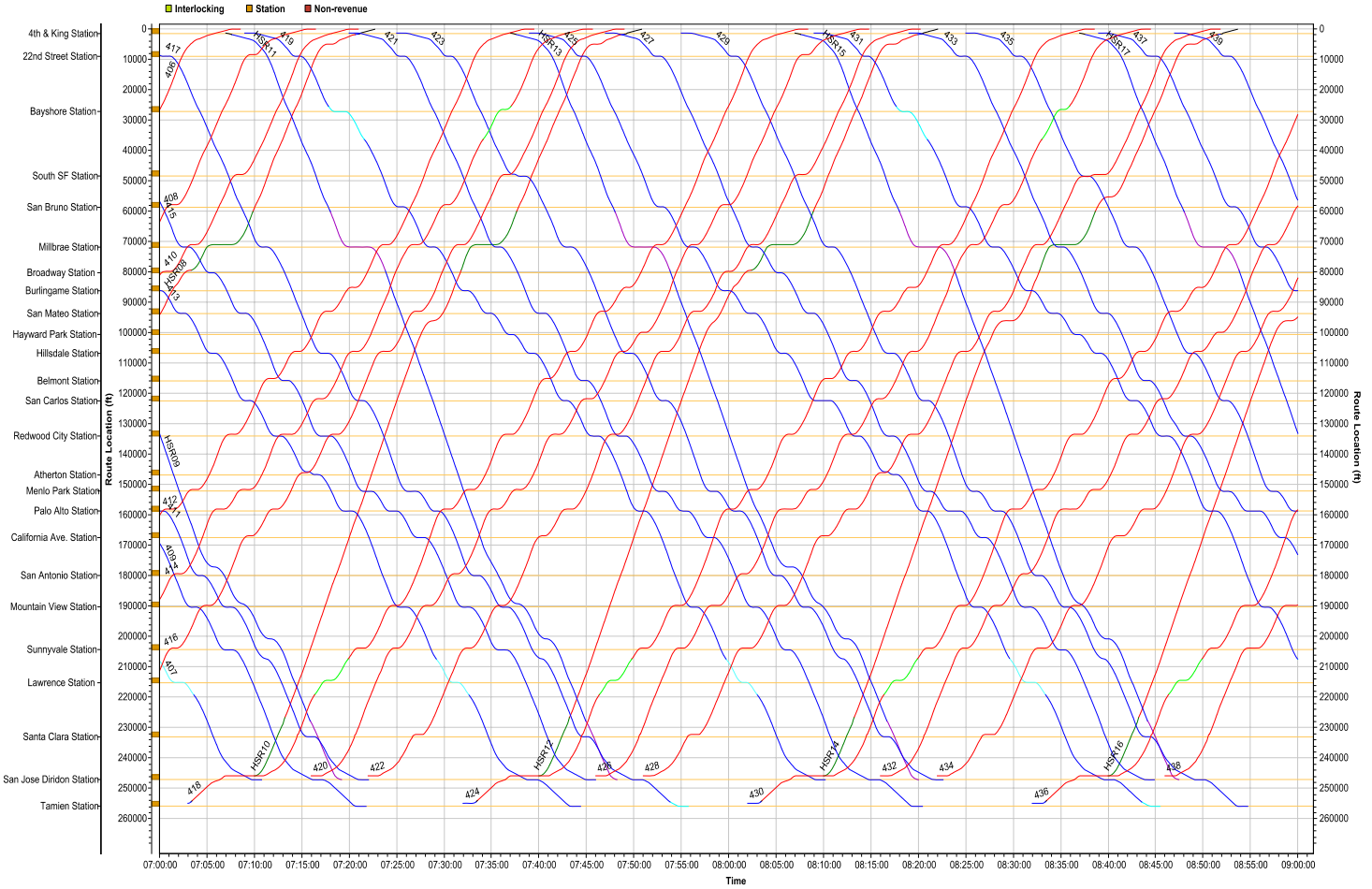


Figure 24. Time-Distance "String" Chart – 7 to 9 AM - 110/110 Baseline Infrastructure 2 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

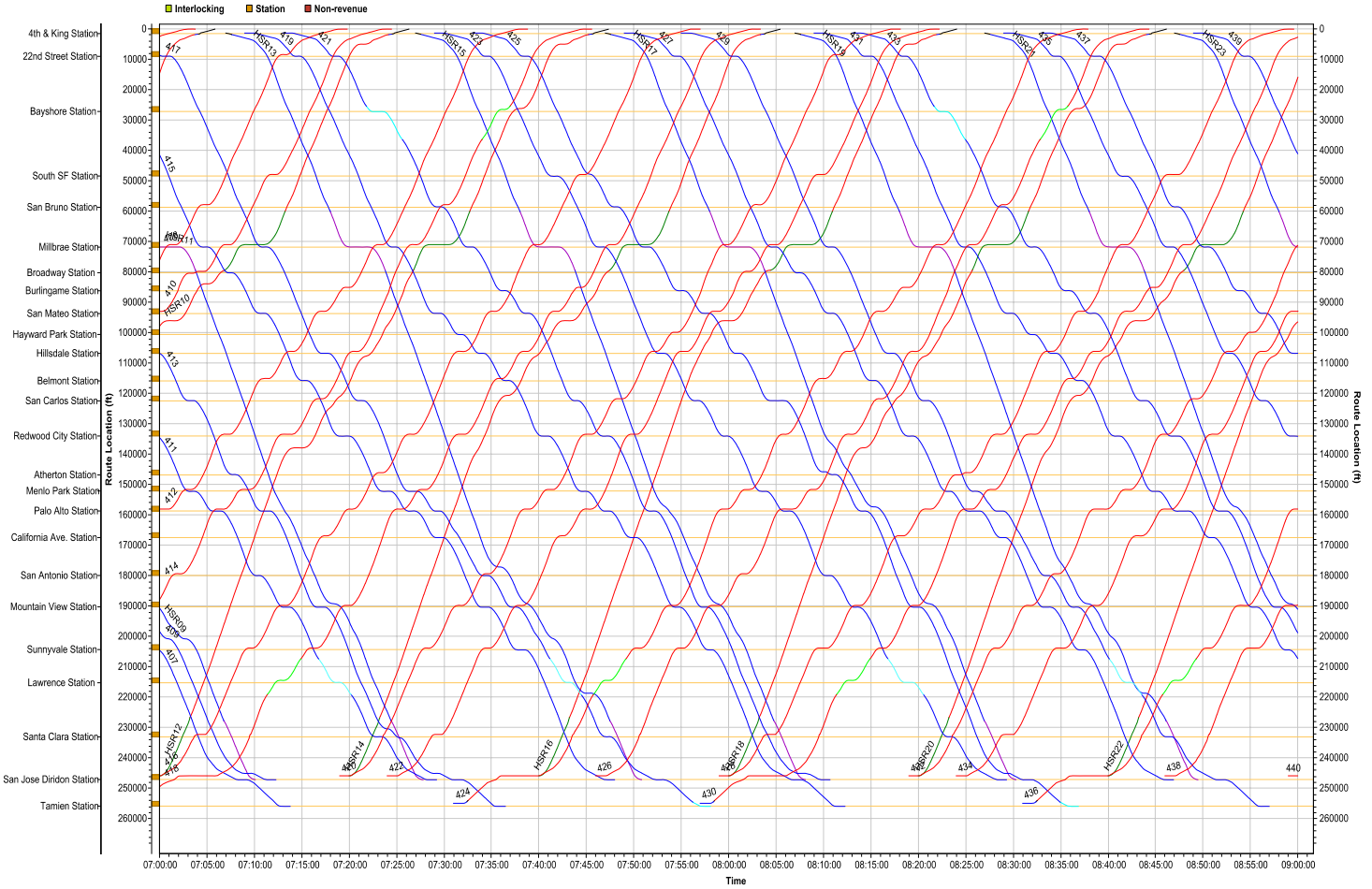


Figure 25. Time-Distance "String" Chart – 7 to 9 AM - 110/110 Baseline Infrastructure 3 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

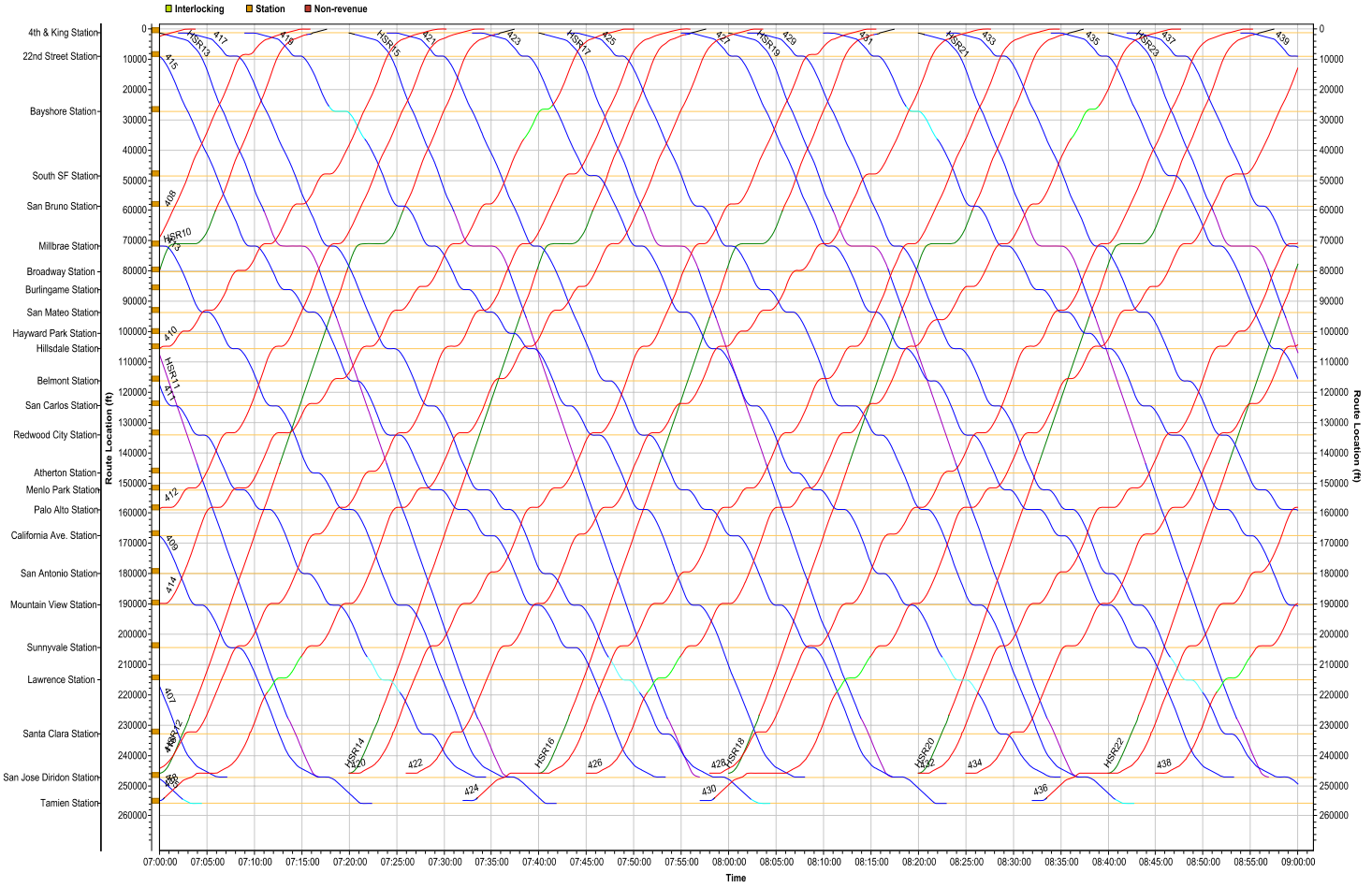


Figure 26. Time-Distance "String" Chart – 7 to 9 AM - 110/110 Full Midline Overtake 3 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

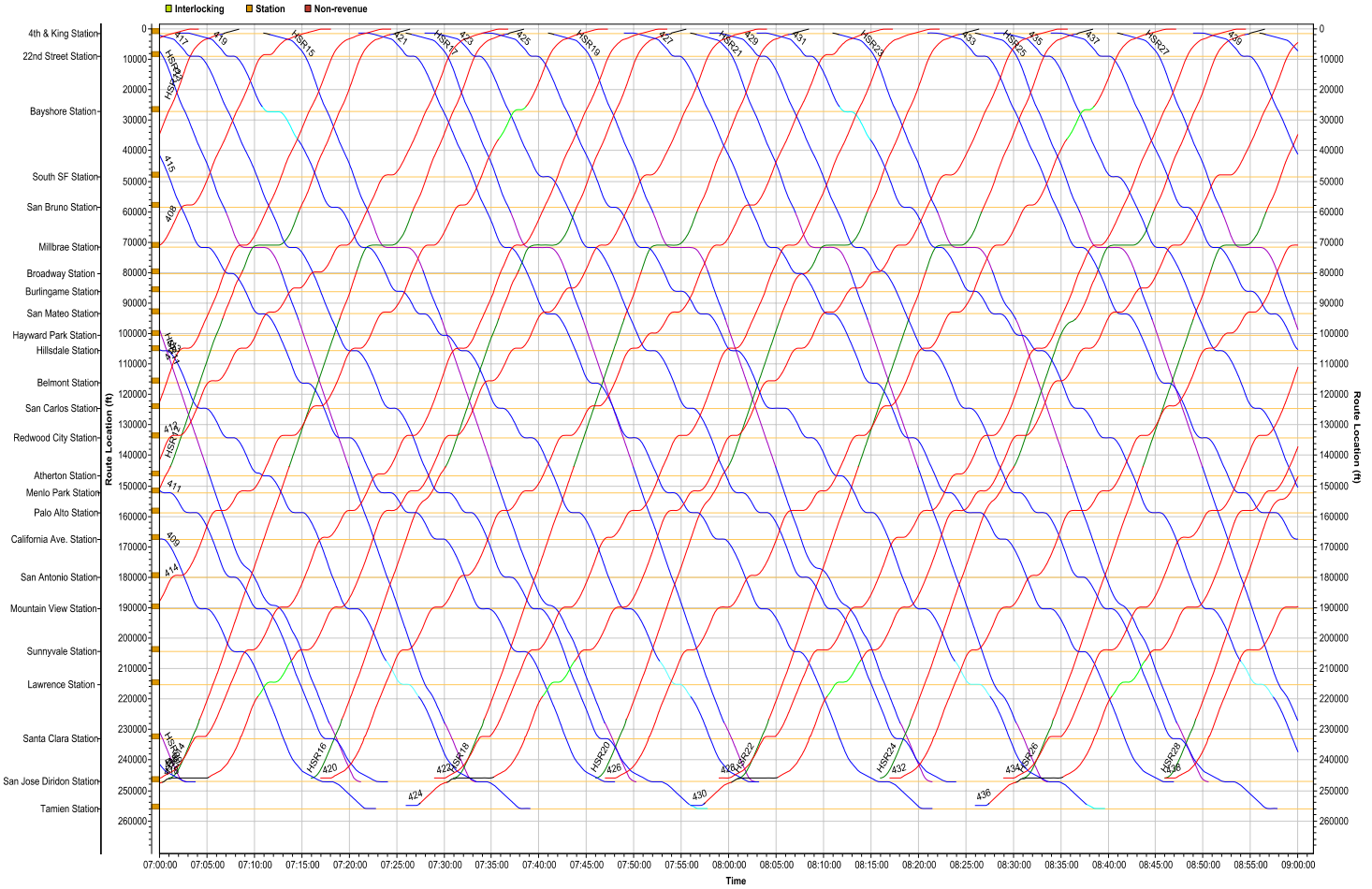


Figure 27. Time-Distance "String" Chart – 7 to 9 AM - 110/110 Full Midline Overtake 4 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

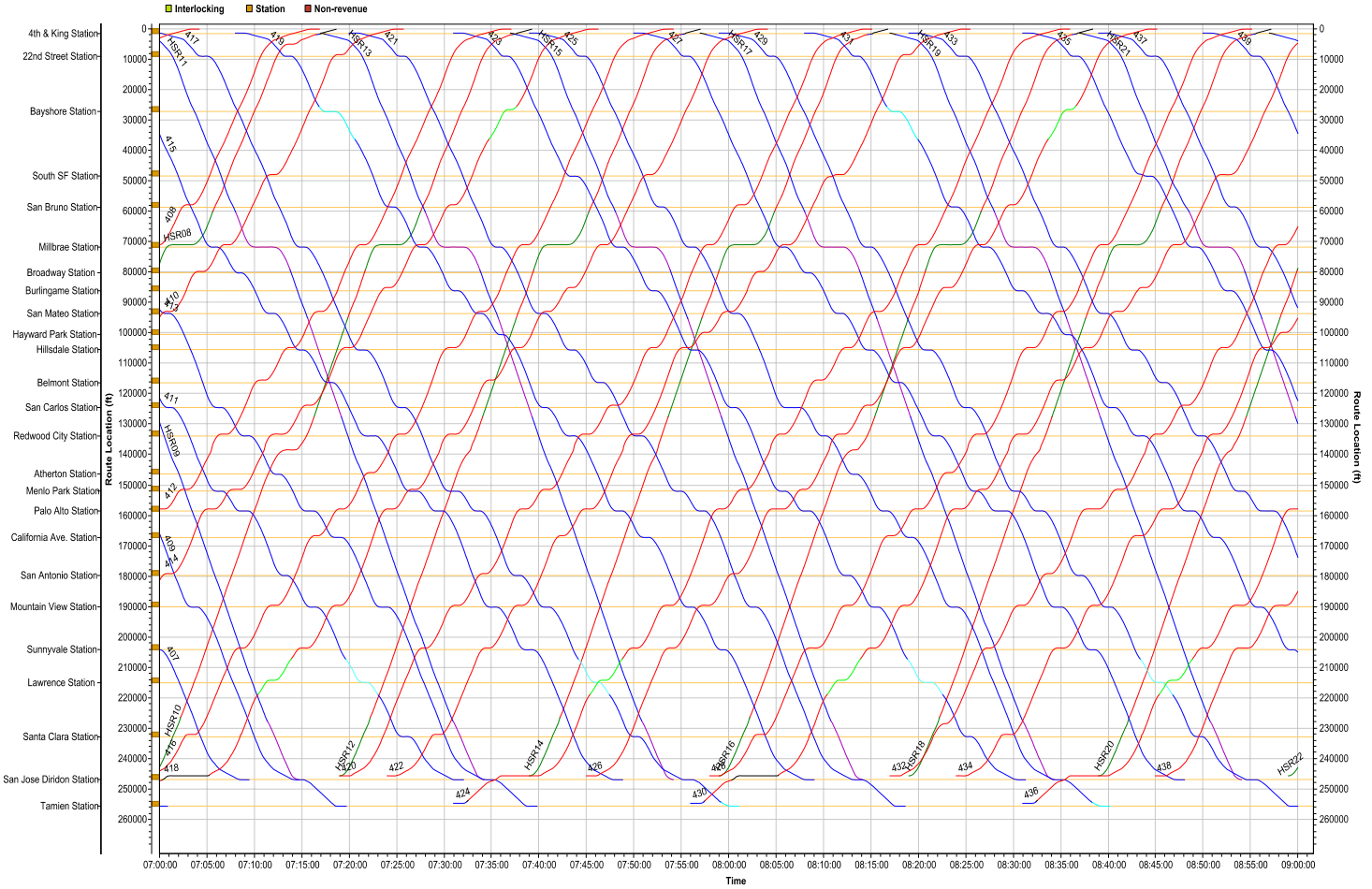


Figure 28. Time-Distance "String" Chart – 7 to 9 AM - 110/110 Short Midline Overtake 3 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

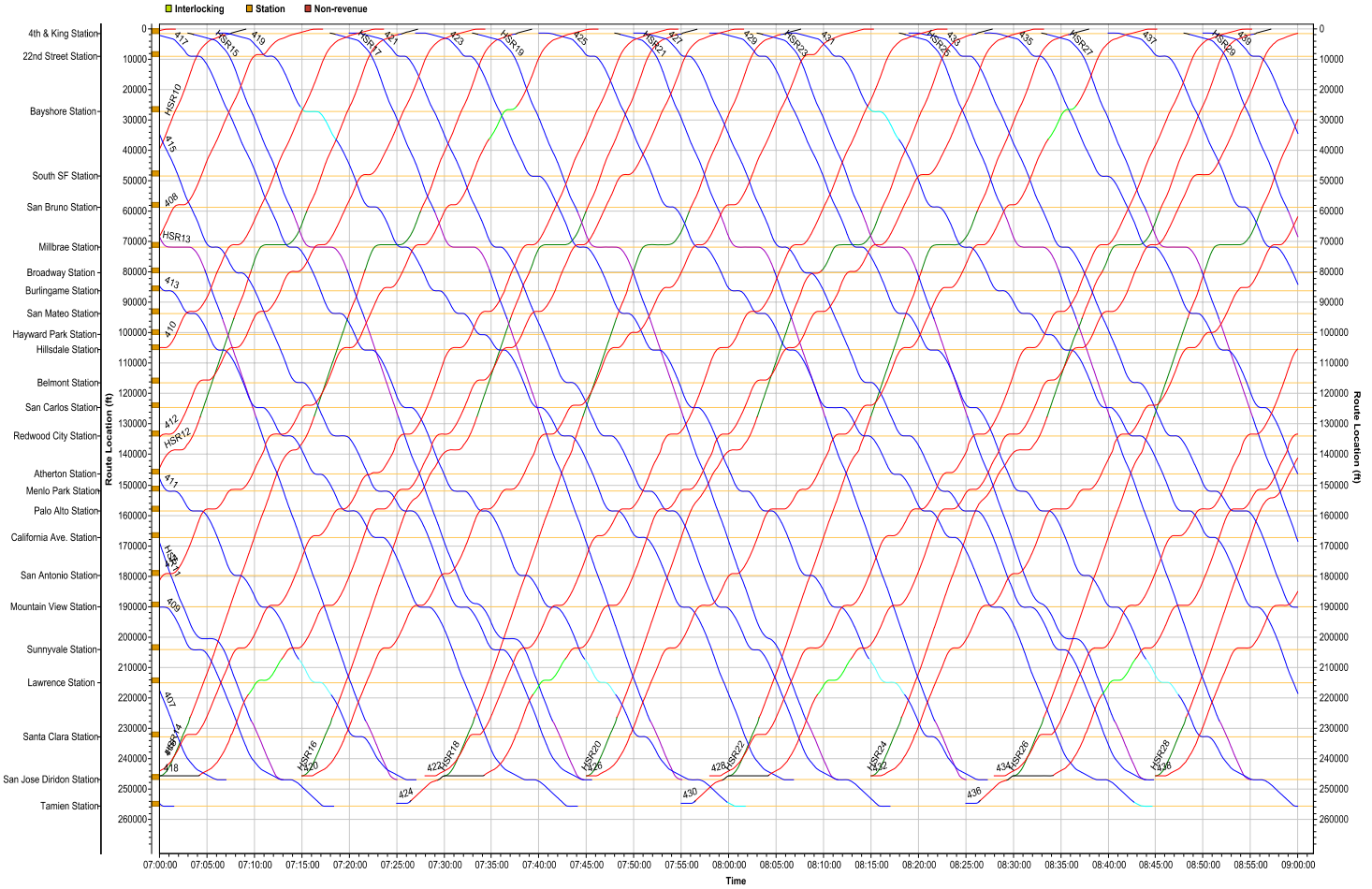


Figure 29. Time-Distance "String" Chart – 7 to 9 AM - 110/110 Short Midline Overtake 4 HSR TPH

7.2 Midday

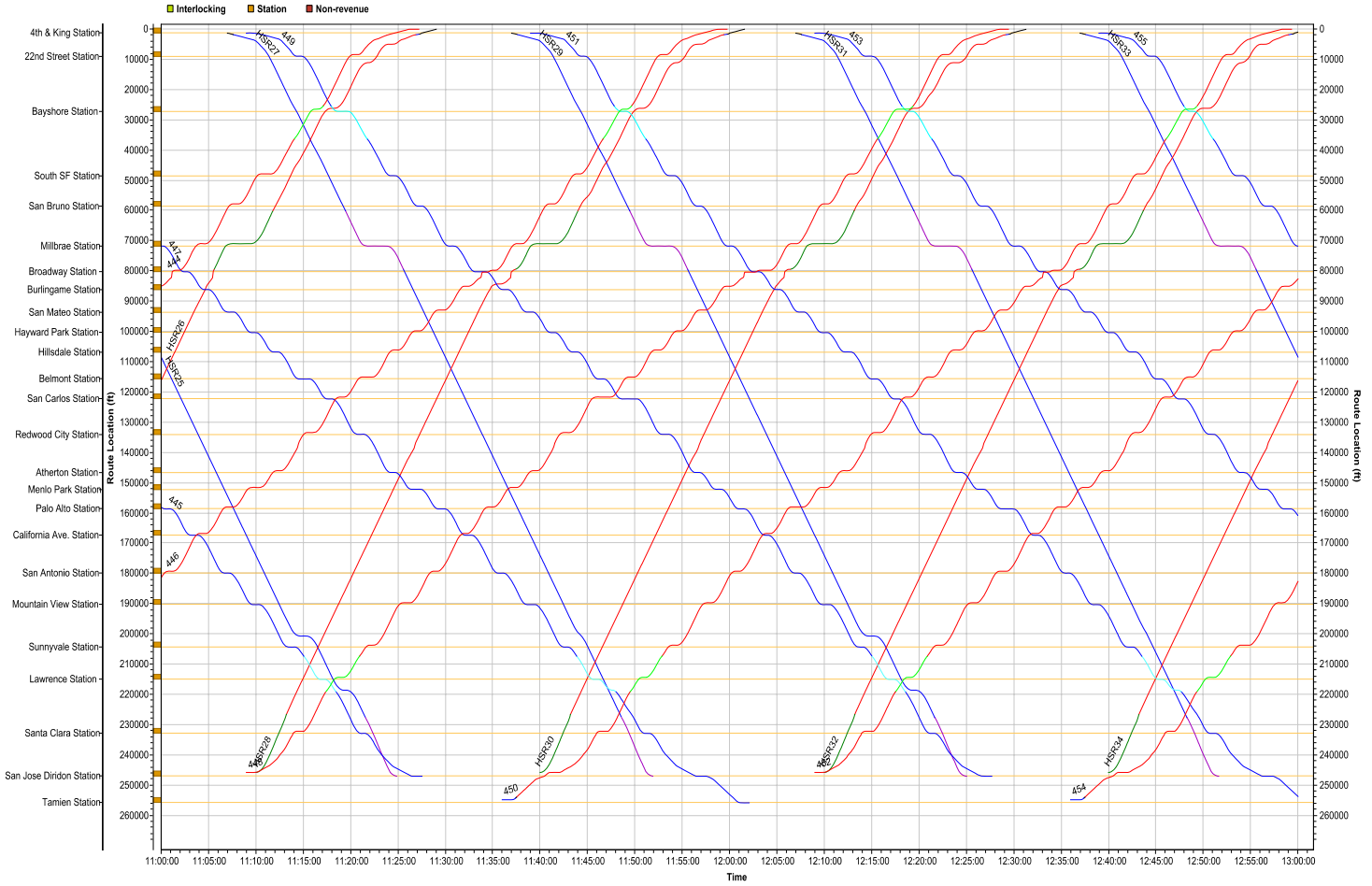


Figure 30. Time-Distance "String" Chart – 11 AM to 1 PM - 79/79 Baseline Infrastructure 2 HSR TPH

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

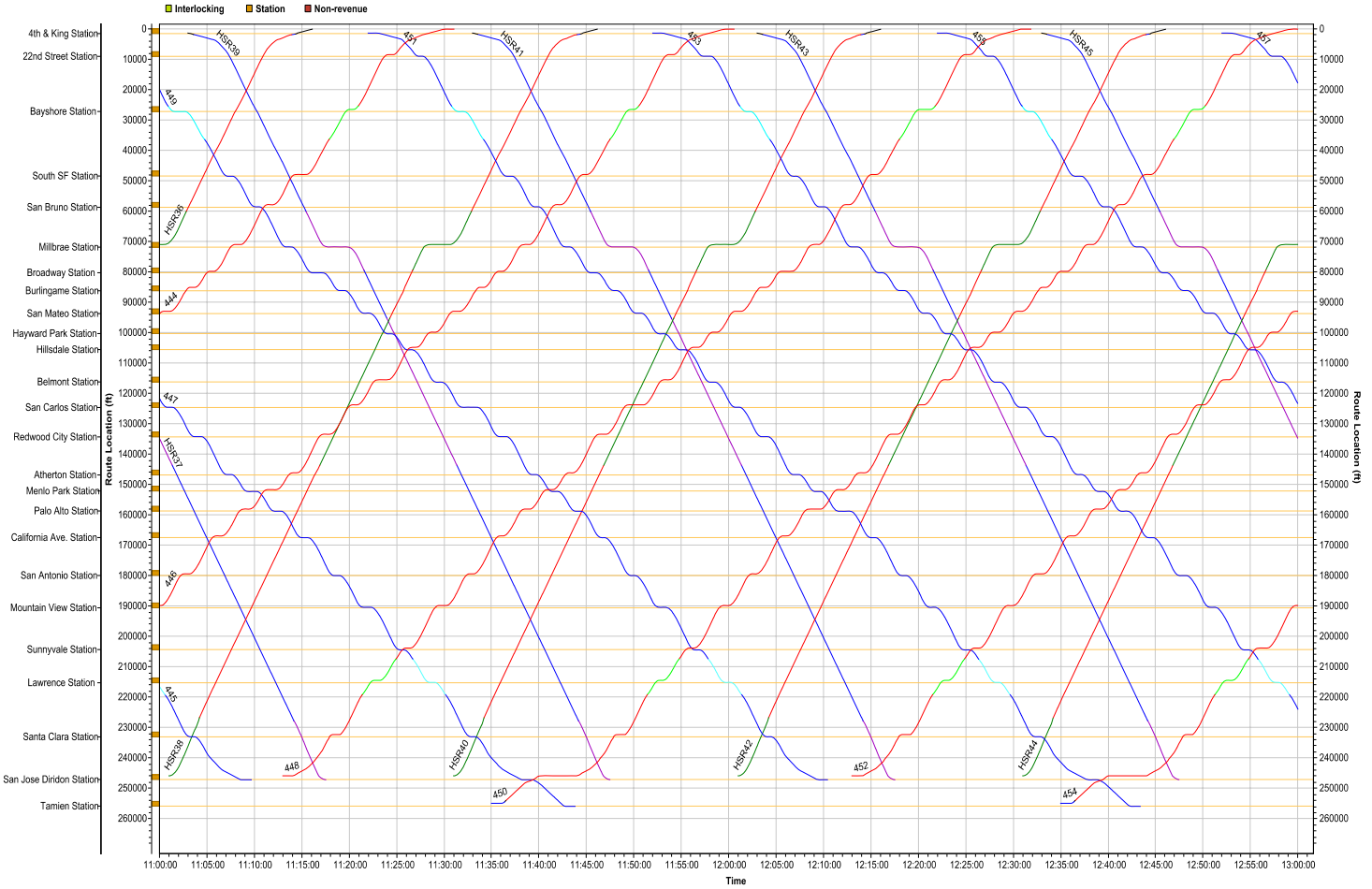


Figure 31. Time-Distance "String" Chart – 11 AM to 1 PM - 79/79 Midline Overtake 4 HSR TPH (2 HSR TPH Schedule in Off-Peak Periods)

8 Appendix C – Glossary

Advance Approach: ***Aspect*** giving a train on the Caltrain Corridor authority to proceed, subject to being able stop at the second wayside signal. Part of existing four ***Aspect*** Caltrain wayside system.

Approach: ***Aspect*** giving a train on the Caltrain Corridor authority to proceed, subject to being able to stop at the next wayside signal. Part of existing four ***Aspect*** Caltrain wayside system.

AREMA formula: Standard formula of the American Railway Engineering and Maintenance-of-Way Association (AREMA)for calculating the safe operating speed for a curve.

Aspect: The particular combination of lights, positions and flashing status of a wayside and/or cab signal that provides the train engineer with information on routing and occupancy status ahead.

At-grade crossing: Highway or street that requires automobile, bicycle and pedestrian traffic to cross the tracks at the same level.

Automatic signal: Wayside signal located between ***Interlockings***.

Automatic territory: Track located outside of ***interlockings***.

Automatic train control: System of wayside and on-board devices that monitors the engineer's compliance with signal indications and, if the engineer fails to comply within a specified time period, automatically applies the brakes to reduce the train's speed or stop it.

Bidirectional-ridership: Ridership that does not follow an AM/PM period specific pattern, as opposed to suburb-to-city unidirectional ridership.

Brake rate: Rate at which a train decelerates on level track.

Cab signaling: Signal indication or speed target displayed to the engineer within the vehicle.

Cant-deficiency: Lateral acceleration to the outside of a curve, expressed by the amount of superelevation that would be necessary to reach a balanced condition (no lateral acceleration). See also **Unbalance.**

CBOSS: Communications Based Overlay System. Caltrain implementation of PTC functionality with additional features for operational improvements.

Central control communication time: Time for the central control (dispatch center) instructions to reach an interlocking.

Clear: ***Aspect*** giving train authority to proceed at maximum speed. Part of existing four ***Aspect*** Caltrain wayside system.

Clockface schedule: A ***timetable*** schedule where trains arrive at an even interval that repeats hourly.

Conflicting route: A train immediately following another train through an ***interlocking*** on a different route that shares some track segments with the first train.

Consist: Collection of rolling stock cars that form a trainset.

Control line: Electrical connection between multiple signals that, when spanning from most favorable ***Aspect*** to most restrictive ***Aspect***, defines the distance that a train can follow another train without needing to make a brake application.

Dwell time: Time from when a train stops a station until it begins moving again.

EMU: Electrical Multiple Unit. Electrified train type where all cars provide ***tractive effort***.

Fleeted route: A train following another train through an ***interlocking*** on the same route without the dispatcher needing to reset the route for the following train.

Full seated load: Maximum seated capacity for a train.

Golden run: Ideal simulation run with best possible vehicle performance, no underspeed and without randomization.

Headway: Time (either scheduled or actual) between successive trains on the corridor.

Holdout rule: Operating rule on the Caltrain Corridor that requires trains to wait for other trains to pass or finish unloading passengers at stations where pedestrians must cross the track.

Interlocking territory: Track located within track junctions where powered switches are present.

Interlocking: Control point protected by signals where movable bridges, rail crossings or turnouts exist.

Layover: Time spent between runs at a terminal or yard.

Loss-of-shunt time: Time for the electrical circuit within an ***interlocking*** to be grounded and then reset.

Maintenance tolerance: Additional conservatism added to safe operating speed to limit occurrences of temporary speed restrictions due to rail wear and loss of ***super-elevation*** over time.

Attachment to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 21, 2012) - Continued

Maximum operating speed: Maximum permissible speed on a given segment of track.

Minimum train separation: Closest distance at which one train can follow another without being delayed.

Passenger alighting time: Total time for passengers to exit the train. It is a component of ***dwell time***.

Passenger boarding time: Total time for passengers to enter the train. It is a component of ***dwell time***.

Peak period: Heaviest ridership periods which, for the Caltrain Corridor, are defined as 6-10 AM in the morning and 3-7 PM in the evening.

PTC: Positive Train Control, an impending FRA requirement for railroads carrying passengers and/or certain types of hazardous materials to enforce safe train separation, civil speed restrictions, temporary speed restrictions and roadway worker safety zones.

Recovery allowance: Time added to a schedule to plan for unexpected delays. See also ***schedule margin***.

Right-of-way: Property encompassing a rail corridor controlled by the railroad.

Rolling stock: Individual car, locomotive or self-propelled multiple unit vehicle of a trainset.

Route reestablishment time: Time required for a train to be granted permission via signal indication to enter an ***interlocking***.

ROW: See right-of-way

Schedule margin: Additional time added to a train schedule to account for unpredictable delays and less than ideal train and engineer performance.

Signal block: Section of track between two signals.

Signal delay: Time that a train is braking or stopped for a signal because it is displaying an ***Aspect*** more restrictive than the best ***Aspect*** that can be displayed at that location for a given train route.

Skip-stop: Scheduling technique of alternating station stops to increase average travel speeds and to reduce trip times.

Super-elevation: Difference in elevation between inside and outside rails in a curve.

Switch movement time: Time it takes for a switch to mechanically change positions and for switch detectors to verify that the switch has moved to the requested new position.

Timetable: Schedule provided to passengers and/or operating personnel.

Track alignment: Horizontal curve values and vertical grade values along the corridor.

Tractive effort: Force that a train's motors generate for forward movement.

Unbalance: Lateral acceleration to the outside of a curve, expressed by the amount of superelevation that would be necessary to reach a balanced condition (no lateral acceleration). See also: ***cant-deficiency***.

Wayside signaling: Signals alongside the track that convey to the train engineer occupancy and/or routing status ahead.

Response to Submission 56 (David Schonbrunn, Transportation Solutions Defense and Education Fund (TRANSDEF), February 22, 2012)

56-104

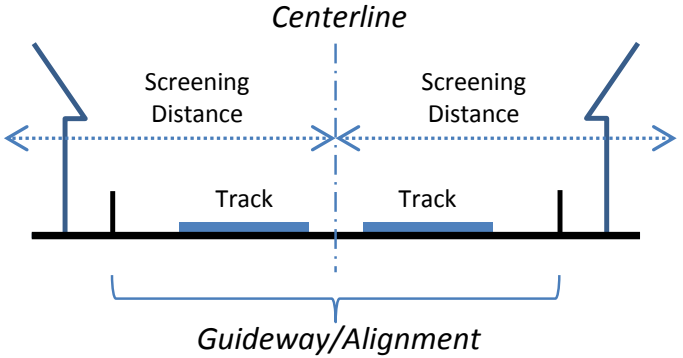
The Partially Revised Draft Program EIR did identify additional significant and unavoidable impacts. These impact determinations were made in response to additional analysis required by the *Atherton 1* and *Atherton 2* litigation. Chapter 6 of this 2012 Partially Revised Draft Program EIR describes that the revisions to the analysis required by the rulings of *Atherton 1* and *Atherton 2* did not alter prior recommendations of the Pacheco Pass Network Alternative serving San Francisco via San Jose as the preferred alternative. In compliance with CEQA, this analysis was published and circulated for public review as part of this 2012 Partially Revised Draft Program EIR.

The Authority does not agree with the commenters' assertion that the Program EIR must study an Altamont Corridor Rail Project plus a San Francisco to San Jose blended alignment as a new alternative in the Program EIR. To meet the travel-time requirements of Proposition 1A, an Altamont Corridor alignment would require crossing the San Francisco Bay. The 2008 Final Program EIR considered an alignment across the Bay in the Dumbarton Corridor. Depending on the particular alignment chosen and the crossing structure (a low bridge, high bridge, or tube), the crossing was estimated to range in cost between $1.53 billion and $3.09 billion (p. 7-125), and would result in large direct impacts on wetlands and bay waters. Refer to the Response to Comment 56-111 for further discussion.

56-105

The screening methodologies in the current FRA (October 2005) and FTA (May 2006) Guidance Manuals (Manual) are very similar and provide specific guidance for program-level analysis. The intent of the screening methodology is to conservatively quantify the number of potentially impacted sensitive receptors ("upper bound on the potential for impact") along a corridor. The screening distance provided in both manuals takes into account several factors such as train speed, noise emission characteristics of current train technology, and the nature of the corridor (characterized by typical existing ambient noise levels for different land use patterns).

The 1998 FRA Guidance Manual did not address HST speeds less than 125 mph, whereas the 1995 FTA Guidance Manual did. The Statewide Programmatic EIR/EIS was published prior to the issuance of the 2005 FRA Manual and the 2006 FTA Guidance Manual and used 375 feet as the screening distance for train speeds up to 125 mph, such as between San Francisco and San Jose and in some areas along Monterey Highway. This screening distance accounts for use of diesel locomotives, which tend to be noisier than current high speed trains. For consistency, subsequent noise analyses for the 2008 Final Program EIR used the same screening distance (375 feet) from the centerline of the guideway (i.e., alignment) that was used in the 2005 Statewide Programmatic analysis (the 2008 data was subsequently used in the 2012 Partially Revised Draft Program EIR). Table 4-1 in the 2006 FTA Guidance Manual states the screening distance is "measured from centerline of guideway/roadway for mobile sources." The 2006 FTA Manual also defines guideway as "supporting structure to form a track for rolling or magnetically-levitated vehicles." This is best illustrated below.



Text in Chapter 2, Pages 2-2 and 2-4, of the Partially Revised Final Program EIR has been revised to better explain the screening distance and how it has been applied, consistent with the FTA guidance.

In addition, the 2005 FRA Manual indicates three HST speed regimes (Regime I, Regime II, and Regime III) used to characterize in general the noise emission from HST. Speed Regime I is characterized by noise dominated by propulsion and machinery and applies up to a transition speed of 60 mph. Speed Regime II (transition speed of up to 170 mph) noise is due primarily to wheel/rail interactions. In Regime III (greater than 170 mph) aerodynamic noise is dominant. Figure 2-7 in the 2005 FRA Manual indicates that high speed train noise is higher at higher speeds (i.e., the greater the speed the greater the noise).

The 2005 FRA Manual provides two sets of screening distances for HSTs: one for Regime II and one for Regime III (none for Regime I). The manual indicates that the screening distance for Regime II with steel-wheeled trains in an urban/noisy suburban area next to a railroad corridor where there are intervening buildings is 200 feet as "measured from the centerline of guideway or rail corridor." The noise screening analyses performed for the 2008 used 375 feet, which is 175 feet greater than what is recommended in the current FRA Guidance Manual and conservatively captures potentially affected receptors.

The Partially Revised Draft Program EIR, Noise and Vibration Technical Memoranda, are the basis of the information contained in the Partially Revised Draft Program EIR and were listed in Chapter 9, Sources Used in Document Preparation, and were available upon request.

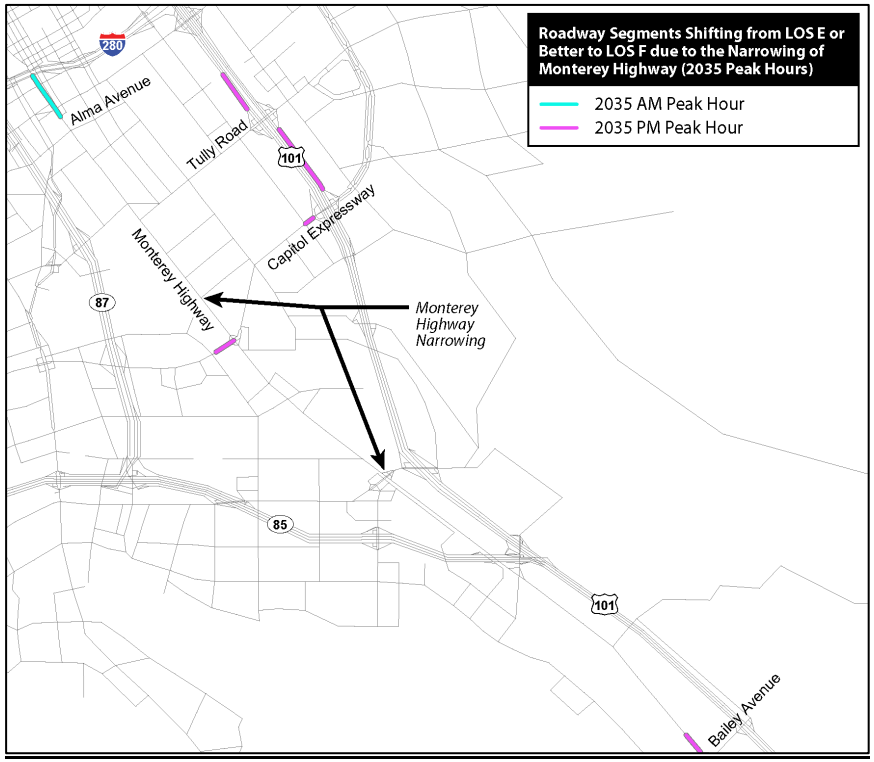
56-106

The text of Chapter 2 of the Partially Revised Final Program EIR accompanying Figure 2-2 depicting the locations of Monterey Highway narrowing and right-of-way shifting explains that where the lanes and right-of-way will shift, it will shift to the east. Please refer to page 2-6 of the Partially Revised Final Program EIR.

The analysis contained within the Partially Revised Final Program EIR uses a conservative approach to analyze the impacts on traffic from the Monterey Highway narrowing. The Partially Revised Final Program EIR analyzes whether the narrowing will cause segments of Monterey Highway itself to operate at LOS E or worse. The Partially Revised Final Program EIR also analyzes surrounding streets that operate at LOS E or worse, and evaluates whether those surrounding streets are anticipated to experience a significant increase in traffic congestion. Focusing on LOS E represents a conservative approach to identification of potentially significant impacts.

A full picture of the actual volume shifts in the traffic network is contained within the figures provided in the appendix to the Traffic and Circulation Technical Memorandum: Monterey Highway.

In response to the comment's focus on LOS F, the following analysis is provided. Under the 2010 peak hours, the narrowing of Monterey Highway would not cause any of the roadway segments to deteriorate from LOS E or better to LOS F. During the 2035 AM peak hour the narrowing would cause one segment of SR 82 near I-280 to deteriorate to LOS F. During the 2035 PM peak hour, the narrowing will lead to the deterioration of one roadway segment each on Monterey Highway, US 101 and I-280 to deteriorate to LOS F. These roadway segments are shown in the figure below. However, it should be noted that this analysis does not include the traffic diverted from the local street system to the HST, which could negate the impact of additional traffic. This level of analysis will be conducted at the second-tier project-level and will be documented in the project-level environmental document and traffic report. The location of the UPRR tracks will be noted in the figures presented for the project-level analysis.



56-107

The effect of the closure of parallel roadways has been addressed on an individual roadway basis. Refer to Response to Comment 59-132 for more information.

The remaining capacity through an intersection is indicated by the volume to capacity ratio, which is shown on the TRAFFIX calculation sheets that were included as an appendix to the traffic technical memorandum listed in Chapter 9, References. The theoretical maximum capacity is represented by 1.0. If the TRAFFIX calculation sheets indicate a volume to capacity ratio of 0.90, the remaining unused capacity through the intersection would be 10 percent. While this information is available, this level of technical detail was not needed in the Partially Revised Draft Program EIR, which focused on more easily understood level of service (LOS) calculations.

The study area established for the analysis encompassed potential changes in circulation patterns that could affect not only the roads where closures would occur, but also the nearest parallel arterial. The analysis conservatively applied diverted traffic onto the nearest parallel arterial and evaluated potentially affected intersections to determine the impacts of those changes under both existing and 2035 forecast scenarios. In Chapter 3, intersection LOS with the HST project is provided for these potentially effected intersections and compared to the existing and 2035 without project scenarios. The significance thresholds established by the local county congestion management agencies were used to determine the level of impact at a CMA-designated intersection, as the comment suggests. The LOS effects of potential lane closures were treated as a potential impact and mitigation strategies were provided in Chapter 3. This analysis covered an area that was sufficiently large enough to determine potential impacts and consider them in the programmatic context. Future project-level analysis will be conducted for project-level alignment alternatives once a preferred programmatic alignment is approved. This project-level analysis will consider potential traffic and transportation impacts at a greater level of detail and provide specific mitigation measures to mitigate identified impacts.

The Authority disagrees that the traffic analysis produces results that were bizarre. The traffic operations results are logical. The following information is provided for the benefit of the reader to address results that may initially seem counterintuitive:

- The shift in traffic from streets that is currently two-way to one-way results in a decrease of traffic on one street and an increase in traffic on certain parallel streets.
- The street with the added traffic usually experiences an increase in vehicle delay at the signalized intersections and degradation in intersection level of service.
- For the street that is converted to one-way, not only are traffic volumes removed for one direction of travel, the signal phases that control that direction of travel is no longer necessary.
- Reducing traffic volumes and signal phases through an intersection will almost certainly decrease the vehicle delay and

improve the level of service. The conversion of two-way traffic to one-way traffic results in some intersections having only one unconflicted right turn onto the one-way street. This is the case at Whipple/Stafford.

- Some intersections report a delay of 0. The TRAFFIX analysis package does not assign a delay value for a right turn from a major street onto a one-way street because there are no conflicting movements.

The mitigation strategies contained in the Partially Revised Draft Program EIR are appropriate for a first-tier analysis. Specific mitigation measures will be developed in the second-tier project-level analysis if it is determined that lane closures are still required after design refinement.

56-108

The new Section 3.18.3C, on Pages 4-4 and 4-5 of the 2012 Partially Revised Draft Program EIR, is intended to replace this same section in the 2008 Program EIR. Some of the impact descriptions provided in this Partially Revised Draft Program EIR, including that relating to the generation of waste pavement, imply that the impact would only result from Monterey Highway construction when in fact they would occur as a result of other highway improvement projects. This text has been clarified in the 2012 Partially Revised Final Program EIR.

56-109

Commenters have selectively quoted technical points made by the Peer Review Panel without noting the conclusion of the Panel in the same August 2011 report that they were "…satisfied with the documentation presented in Cambridge Systematics (2011), and conclude that it demonstrates that the model produces results that are reasonable and within expected ranges for the current environmental planning and Business Plan applications of the model."

The specific points quoted in the comment from the Peer Review Panel's August 1, 2011 Report are not about the entire model, but about specific elements, and misstate the Panel's overall assessment:

- The quote from Page 6 of the August 1, 2011, Report has to do with the constraint on the coefficient for HST headways, and is followed by significant discussion about the process as well as comparative data, and finishes with the statement: "Therefore we conclude that in the end, this problem with the model did not misrepresent traveler behavior in important ways." (p. 7, lines 2 & 3.)
- The Page 7 quote is extracted from a longer discussion about the possible excessive use of constants. Omitting the first four sentences changes the Panel's judgment that the issue is of minor practical importance into an apparent serious flaw. The omitted sentences say: "In Section 4.5 of our first report we criticized the excessive use of alternative-specific constants. The fear was that this would cause the model to be unrealistically unresponsive to changes, or to display paradoxical responses to changes in conditions. The extensive documentation provided to us by CS, in response to our first report, does not reveal such unrealism or paradoxical behavior. Therefore, this originally perceived problem with the model does not seem to be adversely affecting its behavior. In particular, we now think that the magnitude of alternative specific constants is neither an indication of poor model fit nor of inadequate representation of the impact of operational or travelers variables on behavior."

The two reports by the Peer Review Panel indicate that the model as a whole functions reasonably. The Authority disagrees with the comment's characterization that the Peer Review Panel accepted Cambridge Systematics' explanations with "obvious misgivings" The documentation Cambridge Systematics provided to the Peer Review Panel was extensive, and the review process robust. (Independent Peer Review Ridership and Revenue Forecasting Process Reference Materials, July 22, 2011 and August 1, 2011)

The ridership model has been the subject of a litigation challenge brought by commenters. As part of the Atherton litigation, the Superior Court concluded:

> "Cambridge Systematics' analysis is clearly not inadequate or unsupported and Respondent reasonably relied on Cambridge Systematics' conclusions in

approving the ridership model after extensive debate regarding ITS's criticisms of the model. Respondent's thorough explanation regarding its selection is contained in the record."

56-110

The August 2010 San Francisco to San Jose Supplemental Alternatives Analysis Report for the second-tier HST project identifies three basic design options (A, B and B1) to be examined in the Draft EIR/EIS. These options represent "stitched together" alignments that would result in a four-track, fully grade separated railroad serving both HST and Caltrain between Transbay Transit Center and 4th and King in San Francisco and San Jose Diridon Station in San Jose. These design options were developed considering the following goals:

1. **Constructability:** Use uniform structure types that are well known in the rail industry and can be applied uniformly throughout the corridor
2. **Minimize Displacements:** Employ the narrowest track configuration to minimize ROW requirements
3. **Minimize disruption to the Caltrain system during construction:** Use three basic structure typologies (at-grade, aerial and trench) that can be constructed and staged in a way to that allows Caltrain to continue in operation during construction.
4. **Minimizes construction costs:** Develop Design Options A and B to minimize construction costs of the Statewide High Speed Train System while delivering a four-track, interoperable, grade separated railroad that can be shared by HST and Caltrain.
5. **Meet community needs:** Address city and public interest in alternatives that would not visually divide communities and are responsive to concerns regarding potential noise and vibration impacts.

The design options described as A, B and B1 in the Supplemental AA Report all represent conceptually feasible options that, to the extent possible, met the goals outlined above. It is true that some sub-sections of the corridor have a single vertical option either in an at-grade, tunnel or aerial configuration. If the design and environmental process moves forward for a second-tier project in the San Francisco to San Jose corridor, towards a 15% design level and a complete Draft EIR/EIS, it is anticipated that the vertical profile options would be reassessed.

However, the Authority put its second-tier (project level) EIR/EIS work on hold as of May 2011. The conclusions of the Authority's 2010 alternatives analysis process is not binding, does not indicate any final decision, and will not constrain continued evaluation of options in cooperation with Peninsula cities if the Caltrain Corridor is part of the selected network alternative. Any second-tier project that focuses on a blended system approach would include continued evaluation of vertical profile options.

56-111

The Authority does not agree that the Altamont Corridor Rail Project, with adjustment, is a reasonable alternative for study in the current Program EIR for the HST in the Bay Area to Central Valley study area. The comment appears to conflate an HST alternative involving an Altamont alignment with the Altamont Corridor Rail Project (ACRP), a distinct and different effort. The projects differ in many ways including: (1) the purpose and need/project objectives, (2) the design criteria (and resulting operational features), (3) and the ridership market addressed

The statewide HST system has been developed for a purpose and need separate from the ACRP. Whereas the HST system is focused on interregional connections between the major markets in northern California, Southern California, and in the Central Valley, the ACRP purpose is to serve regional trips and act as a feeder to the intercity HST system. Accordingly, the ACRP alignment represents a different approach to the original HST Altamont Pass alternatives (discussed in the Program EIR); with a design facilitating operating speeds lower than those of HST and avoiding impacts associated with greater speeds, including noise, vibration, and requirements for additional right-of-way and structures. Through its alignment and station location alternatives, the ACRP has been developed to maximize *regional* ridership. (Altamont Corridor Rail Project, Notice

of Preparation, 2009; Altamont Corridor Rail Project, Preliminary Alternatives Analysis, 2011.)

However, tailoring the design of the ACRP to meet a regional trip-focused purpose and need and to avoid the additional impacts associated with HST operations necessarily diminishes objectives related to the intercity travel market addressed by the statewide HST Project, most notably travel speed and directness of routing. Thus, gains in regional ridership that would accrue to the HST Project as a result of utilizing the ACRP route would be offset by a decrease in intercity HST ridership, as compared with the use of an alignment designed solely for HST services, whether across Altamont Pass or Pacheco Pass. The Authority therefore disagrees with the statement in the comment that the proposed alternative would yield 108.5 million riders.

For example, the proposed alternative that would follow an Altamont Corridor Rail Project slower speed alignment from Modesto to San Jose would have a slower top speed and would be on the order of 25-40 minutes slower than the Altamont Pass network alternatives examined in the 2008/2010/2012 Program EIR analysis. The optimal non-stop run time from Tracy for a full speed option over the Altamont Pass into San Jose in the 2008 EIR/S document is 25 minutes, without any pad for operations contingency (Appendix 4E of 2008 Final Program EIR). In the Preliminary Alternatives Analysis Report for the ACRP, Appendix E shows run times with similar assumptions for the alternatives carried forward by segment, which when added show between 45 and 60 minutes for the Tracy to San Jose segment. In addition, the reversal of direction and the activation of control from the other cab compartment will likely add several minutes to the time normally required in the station to unload and board passengers. The slower speed and added travel time to reach San Jose would lower ridership, actually reducing ridership below the ridership for an HST Altamont Pass network alternative with San Jose terminus of 94.6 million riders.

The comment also notes that an alignment that travels over the Altamont Pass, down to San Jose, and then up the Peninsula would avoid the operational issue associated with reduced frequency of trains to San Francisco and San Jose that reduces ridership. As indicated in Chapter 6, the blended system approach would involve a more limited train frequency on the northern end section of the HST system, making the split in service and reduced frequency a less important factor than previously considered for all network alternatives that would serve more than one city via a split in the line. (Parsons Brinckerhoff, Technical Memorandum on Alternatives Suggested in Comments on Partially Revised Draft Program EIR, April 2012.)

The comment summarizes four major environmental issues associated with the HST connection between the Bay Area and Central Valley. The comment limits community impacts to the Peninsula, however, and fails to recognize that the Program EIR identified impacts to communities across the alignments in the study area. Moreover, it is not correct to characterize an HST alternative as being capable of avoiding all impacts. There are environmental impact tradeoffs with any of the network alternatives, as discussed in Chapter 6.

56-112

The 2008 Final Program EIR, as supplemented by the 2010 Revised Final Program EIR and this 2012 Partially Revised Final Program EIR, analyzes 21 networks utilizing the Altamont Pass and Pacheco Pass alone or in tandem. This range includes an Altamont Pass Network Alternative with a terminus in San Jose. As noted in the comment, due to this alternative meeting the HST performance criteria in Chapter 2 of the 2008 Final Program EIR, including a fully dual track mainline and off-line station stopping tracks as well as capable of speeds in excess of 200 mph, this alternative achieved a trip time of 2 hours 19 minutes from San Jose to Los Angeles. Adding a San Francisco to San Jose leg for illustrative purposes would result in a 2 hours, 39 minute travel time from San Francisco to Los Angeles. The preferred Pacheco Pass network alternative would achieve a trip time of 2 hours and 9 minutes from San Jose to Los Angeles (and 2 hours 39 minutes from San Francisco to Los Angeles. (2008 Final Program EIR, Table S-8-1.)

The ACRP alignments have been designed for modern regional rail operations, but not for 220 mph high-speed service. ACRP stations would have only two tracks and there would be no passing tracks to

permit high-speed operations. As proposed, the ACRP alignments would be designed to accommodate HST vehicles but not HST service (high-speed trains could travel on ACRP tracks, but at conventional speeds). Thus, the ACRP alignment from the HST mainline would provide a longer, slower route between the Merced wye and the Bay Area (about 55 mph at high speeds between the wye and Manteca then about 70 mph at conventional speeds to San José) than the preferred Pacheco Pass alternative (120 mph at high speeds). Alternatives developed for the Altamont Corridor Rail Project identified to be carried forward in the Preliminary Alternative Analysis all include speed-limiting curves, due to the trade-offs between speed and environmental impacts. These limit speeds at locations along the EB-4, EB-5, and EB-6 alternatives between Santa Clara and Milpitas to 55mph. Similar speed limiting curves exist in Livermore for the TV-2a, TV-2b, TV-2C, and TV-4 alignments. Similar speed-limiting curves exist on the Pacheco Pass alignment where the alignment makes an "S" curve over the I-280/SR 87 interchange in San Jose.

It would not be possible for a train using the ACRP alignment then running blended up the peninsula to meet the mandated travel time between Los Angeles and San Francisco. Even if the peninsula line were eventually converted to high-speed service the longer, slower trip between Manteca and San José would prevent statewide trains from meeting the mandated travel time if they used the ACRP route. Any ACRP operation would be on the order of 25-40 minutes slower than the Altamont alternatives examined in the 2008 PEIR/EIS analysis. The optimal non-stop run time from Tracy for a full speed option over the Altamont Pass into San Jose in the 2008 EIR/S document is 25 minutes, without any pad for operations contingency (Appendix 4E of the Altamont Preliminary AA). In the Altamont Corridor Preliminary Alternatives Analysis, Appendix E shows run times with similar assumptions for the alternatives carried forward by segment, which when added show between 45 and 60 minutes for the Tracy to San Jose segment. In addition, in San Jose the reversal of direction and the activation of control from the other cab compartment will likely add several minutes to the time normally required in the station to unload and board passengers. Thus the run times that are already slower as shown earlier for a blended Altamont A1 scenario would be a further 25-40 minutes slower.

The comment indicates that the Altamont Corridor Rail Project San Francisco/San Jose proposal would greatly reduce environmental impacts. Development of the HST system alignments in the Program EIR have been based on balancing the project's objectives and fundamental purpose while minimizing environmental impacts. Alternatives developed for the Bay Area to Central Valley Program EIR had similar speed-limiting curves on both Pacheco and Altamont alignment alternatives. Again, the presence of speed-limiting curves is the result of balancing potential travel times against environmental and engineering issues.

While the ACRP is being designed with conventional rail criteria (e.g., curves are sharper than for HST) it still will require new right-of-way and, like all major infrastructure projects, it will have some negative environmental impacts. It is unreasonable to assume that the ACRP will have no environmental impacts relative to the high-speed Altamont alternative evaluated in the EIR. The ACRP would have no impacts on San Francisco Bay (no bay crossing proposed) but it would have impacts in parts of the East Bay, crossing the East Bay Hills, in the Tri-Valley, crossing the Altamont Pass, and in portions of the San Joaquin Valley. For example, ACRP Alternative EB-5 on structure above I-880 in Hayward could have construction impacts on the highway, it potentially could affect 8 acres of wetlands and 1 acre of agricultural land in Santa Clara County. ACRP Alternative TS-1 connecting Tracy and Stockton could affect highway traffic on SR 120 and SR 4 could increase traffic on local streets in Lathrop, and the structure would have a visual impact on residential and institutional land uses in Lathrup. Any such impacts would be part of the proposed ACRP+SF/SJ Blended proposal. Replacing the preferred alternative with the proposed ACRP+SF/SJ Blended proposal would not eliminate all impacts associated with the suggest TRANSDEF proposal because all major infrastructure projects have impacts.

Finally, while the Authority's Draft/Final 2012 Business Plan promotes a blended system approach for the highly urbanized "book-end" sections, the commenter's proposal would have 125

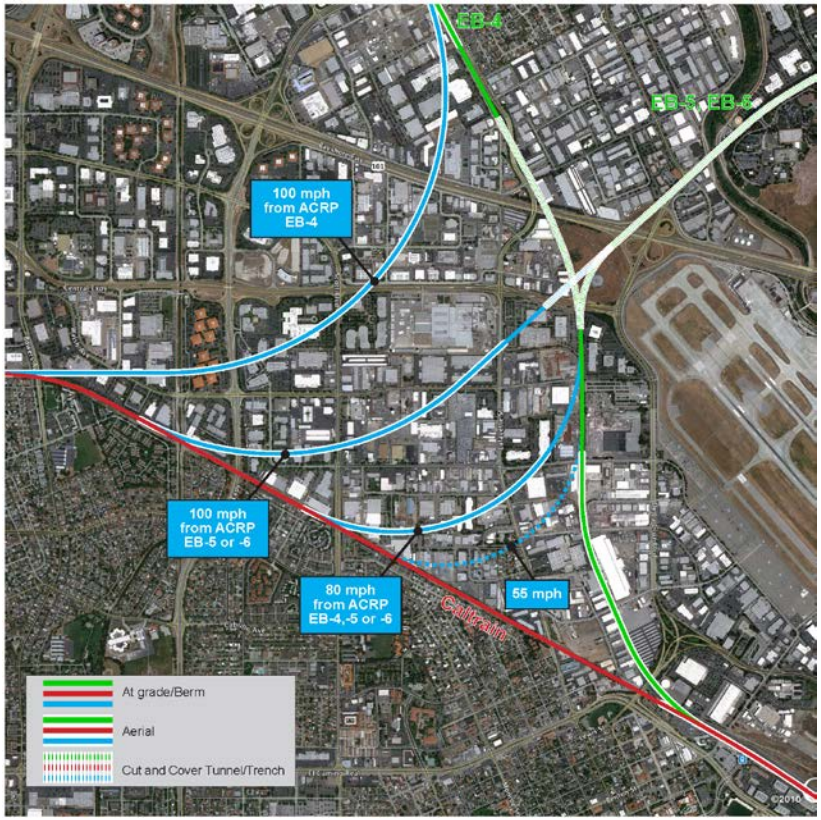
miles of slower speed alignment as compared to 50 miles of slower speed alignment for the preferred Pacheco Pass network alternative if a blended approach is used for San Francisco to San Jose. (Parsons Brinckerhoff, Technical Memorandum on Alternatives Suggested in Comments on Partially Revised Draft Program EIR, April 2012.)

56-113

Table S.8-1, Summary of Characteristics and Impacts for the Network Alternatives of the 2008 Final Program EIR reported express travel times between San Francisco and Los Angeles of 2:38 utilizing a Pacheco Pass alignment and 2:36 using an Altamont Pass (via Dumbarton) alignment. Utilizing the most direct alignments from Niles Junction in Fremont to Redwood Junction in Redwood City, the distance via the UPRR Centerville Line and Dumbarton Bridge is approximately 16.4 miles based on the alignment identified in this Program EIR. Via the ACRP PAA EB-6 alignment, it is 16.8 miles to Santa Clara. Assuming a wye connection from the EB-6 line near the intersection of Central Expressway and Trimble Road to Caltrain at Bowers Avenue, including extensive property acquisition for the wye, this route distance would total 32.9 miles from Niles Junction to Redwood Junction. This would be an additional 16.5 miles greater than the most direct route via the UPRR Centerville Line and Dumbarton Bridge. Curve radii allowing travel at 100 mph, 80 mph, and 55 mph were obtained from the January 2011 Altamont Corridor Rail Project Alternatives Analysis.

Assuming a generous average speed of 100 mph, a routing via a wye in Santa Clara would increase travel time by 10 minutes over the Dumbarton route. Travel times were optimized for the initial statewide study, so any additional potential optimization would affect travel times all along the San Francisco to Los Angeles route for both Pacheco and Altamont alignments. In summary, a deviation from the Dumbarton Corridor to Santa Clara between Niles Junction and Redwood Junction is double the distance and add an additional ten minutes to EXPRESS, non-stop travel time.

We note in addition that the feasibility of a wye junction in Santa Clara to go north on the Caltrain Corridor as a method of reducing travel time to San Francisco is highly speculative. Santa Clara is a very densely developed area. As shown in the figure below, departing from existing transportation corridors to create a new "wye" connection would be highly disruptive. The new right-of-way for the wye connection would require acquisition of many developed properties, and the junctions allowing the tracks to split from the EB-4, EB-5, and EB-6 or the Caltrain line would require two additional tracks parallel to the through tracks. These additional tracks would allow diverging trains to leave the main tracks, and pass over or under the main tracks. This would result in a length of four-track alignment along the eastbound right-of-way and a six-track alignment along the Caltrain right-of-way.



56-114

The comment is not correct in stating that the Altamont Corridor Rail Project's key difference from Altamont Pass network alternatives is avoiding the Don Edwards National Wildlife Refuge. The 2008 Final Program EIR studied several Altamont Pass network alternatives that would avoid the Don Edwards National Wildlife Refuge. This included: Altamont Pass with Oakland and San Jose termini; Altamont Pass with San Jose terminus; Altamont Pass with Oakland terminus; Altamont Pass with Union City terminus; Altamont Pass with San Francisco, San Jose, and Oakland termini with no Bay crossing.

The 2011 Altamont Corridor Rail Project Preliminary Alternatives Analysis Report expanded the examination of environmental impacts to inform alignment alternative designs to identify and reduce potential environmental impacts of the HST alternatives, utilizing the design flexibility associated with a slower speed, regional rail service. While the commenter's Setec proposal from 2010 may have avoided sensitive areas immediately along Niles Canyon and Sunol Creek, protected lands, identified by the California Department of Conservation, often extend far beyond the immediate riparian corridor. Much of the Sunol Valley and rural area along Arroyo Valley south of Livermore are protected lands. The location of alignment alternatives for HST that were considered but not carried forward for further study differ in the Niles Canyon and Sunol Creek areas compared to those for the slower speed, regional rail service identified in the 2011 Altamont Corridor Rail Project AA which are south of SR-84. The Altamont Corridor Rail Project AA proposes a South of Livermore alternative in a 7-mile tunnel under the Arroyo Valley.

56-115

The comment is incorrect that the statement in Chapter 6 regarding the relative effect of Union Pacific Railroad's refusal to allow use of its rights of way is a greater challenge for Altamont Pass network alternatives than Pacheco Pass network alternatives. The 2010 Revised Final Program EIR, Chapter 3, includes an illustration of the interface of the alignments in the study area with UPRR. This evidence supports the conclusion that while an interface with UPRR is involved with both passes, it is measurably more challenging for Altamont Pass network alternatives.

UPRR's refusal to allow use of its rights of way is a consideration for the Altamont Corridor Rail Project as well. It is not entirely clear how to apply the comments to the ACRP San Francisco/San Jose proposal, (the comments discuss blended service along the Caltrain corridor, avoiding a Dumbarton crossing (as the commenter notes use of ACRP EBWS-1alignment and states "such a route, in combination with the blended system approach, would eliminate the most serious environmental impacts of any network alternative studied to date"), and adapting BART's Dublin line for HST and regional service). This response assumes an Altamont Pass crossing, then an alignment south towards San Jose before utilizing Caltrain to access San Francisco, and/or a potential wye at Santa Clara as described by the commenter. For illustrative purposes only, this response also assumes a second HST line from a junction in the Livermore area that would follow the median of I-580, replacing BART at least as far as the Bayfair Station in San Leandro, as described by the commenter.

There are differing levels of interaction with the Union Pacific Railroad which the commenter has blurred. The Authority is working in all sections throughout the statewide system to avoid interfering with any freight railroad's operations. In short, beyond mitigable construction impacts such as possible shooflys, the HST project would not impact a freight railroad's operations, although there might be cases where the HST purchases and utilizes excess right-of-way from the existing railroad that the railway does not need for its operations.

As stated, UPRR has held a position "denying use of its rights-of-way for HST tracks." UPRR also has stated its displeasure with interference with the spur tracks leading from its right-of-way to adjacent businesses and potential future businesses. This is a different case from that described in the preceding paragraph. While UPRR may have a right-of-way that could accommodate HST without interfering with UPRR's operations, HST must plan to be implemented adjacent to the UPRR right-of-way.

To implement a HST route via Altamont, even a slower speed ACRP, there are many locations where not being able to use a portion of a UPRR right-of-way, even in locations where the right-of-way is so wide that HST could be placed such that it wouldn't interfere with UPRR operations, would require extensive property acquisitions adjacent to the UPRR. These locations include the crossing of central Tracy, between Pleasanton and Livermore, and in the Fremont area. If the commenter's Dublin HST line is considered, similar impacts to the UPRR would occur if the line were assumed to extend north towards Oakland from the Bayfair BART Station.

The commenter states that ten significant and unavoidable impacts from a Pacheco Pass alignment would be eliminated with the Altamont Corridor Rail Project San Francisco/San Jose proposal. The Partially Revised Draft Program EIR Table 1-1, Summary of Environmental Impacts and Mitigation Strategies, lists them. It is unclear how the commenter has determined that an ACRP alignment would eliminate the following:

- Potential lane loss on the Peninsula or in Hayward- The network described by the commenter utilizes either the Caltrain Corridor from Santa Clara to San Francisco or the Caltrain Corridor from San Jose to San Francisco, as the Pacheco alternative would, so the impacts from potential passing tracks or grade separations even under a blended scenario would be the same. The blended alignment is a phase of eventual HST build out and environmental review must account for the project's build out. An alignment up the East Bay is more likely with an ACRP alignment, so impacts to lanes in Hayward are much more likely with that alignment.
- Construction impacts as the result of a HST project occur for any network or alignment, just in a different location.
- An interim station at Union City BART for an ACRP alignment or at San Jose Diridon Station for a Pacheco alignment would impact traffic. The Union City site is over two miles from the nearest freeway access, while San Jose Diridon is less than one-half mile, leading to potentially longer trips on local streets for passengers accessing the Union City interim station by auto.
- An interim station at Union City BART (or Bayfair) for an ACRP alignment or at San Jose Diridon Station for a Pacheco alignment would each impact connecting commuter rail service. Caltrain already provides express service (in varying service patterns) from San Jose Diridon to SFO/Millbrae and San Francisco. BART operates 12 trains/hour midday and peak that make all stops en route to San Francisco. Caltrain has projects planned to increase capacity significantly; BART's transbay service is near capacity with additional capacity requiring extensive expansion to access at its downtown San Francisco stations and a potential second bay crossing. Additional capacity to absorb HST passengers utilizing an interim station is more easily implemented for the Pacheco alignment, as the capacity increasing projects for Caltrain are able to be implemented incrementally.
- Grade separations would be constructed along either a Pacheco or Altamont HST alignment, creating similar impacts for similar types of separations.

Converting BART's Bayfair-Dublin line for HST use would require more effort than re-gauging the tracks. The loading gauge (or clearance envelope) for a HST train and a BART train are drastically different. While the width of a BART train is greater than a TGV Duplex, it is narrower than a Velaro D, which is the latest design for both the German Railways and new Eurostar trains.

It is the differences in the overall dimensions of the operating envelope that make the replacement of BART with HST a very daunting task. BART's operating envelope is approximately 14' high by 32' wide for two tracks, while HST is 27' high by 50' wide. The primary reason for this is that BART uses a low, electrical "third rail" to supply power to its trains, while HST is supplied with power by a suspended overhead wire, held aloft by poles along the tracks. The third rail is tucked in close to the tracks below the floor level of the cars. The poles for the HST's overhead wire are located a safe distance from the tracks, creating a much wider operating envelope.

Two obvious consequences of replacing BART with HST in the median of I-580 is that the rail operating envelope would need to be expanded horizontally into the existing interior freeway shoulders and travel lanes and that vertical clearances beneath existing

roadway overcrossings would need to be increased by approximately 10'-6" (assumes 16'-6" standard interstate freeway clearance) or 13'-0" (assumes 14'-0" BART clearance). Raising overcrossings would require grade changes to crossing roadways that could impact nearby intersections and business access, or require the reconstruction of multiple spans of connecting aerial ramps at both the I-580/I-238 and I-580/I-680 interchanges. Lowering the HST tracks would require additional width from the adjacent freeway to build retaining walls and could require the reconstruction of footings for overcrossings. Additionally, even if it is assumed that BART's current vertical profile in the I-580 median is suitable for HST, the additional dips to pass under overcrossings might not be feasible at some locations. Undercrossings for roads or waterways might also limit the locations where the HST track could be dipped under overcrossings.

Terminating the line where it intersects BART at the Bayfair Station would require development of a separate HST station and end of line facilities. Continuance on to Oakland would encounter similar right-of-way issues discussed for an East Bay HST line. The commenter's suggestion of continuing the line across San Lorenzo beneath Lewelling Boulevard and thence along the bay to a new bridge parallel to the San Mateo Bridge and thence along the San Mateo bayside to meet Caltrain somewhere near SFO would have almost three times the length of alignment crossing bay shorelines, wetlands and open water than a Dumbarton crossing, which leads to an assumption that it would be have greater environmental impacts than other potential bay crossings.

56-116

The Authority disagrees that the introduction of a discussion of project phasing and specifically the "blended system approach" to construct a high speed train compatible system between San Francisco and San Jose constitutes the introduction of a new alternative that triggers recirculation of the Program EIR. The blended system approach is an implementation option for a second-tier project, not a first-tier network alternative identifying the corridor that will connect the HST between the Bay Area and the Central Valley. This is the way it is described in the Draft 2012 Business Plan, the Revised 2012 Business Plan, and the Partially Revised Draft/Final Program EIR. The manner in which a blended system approach would reduce impacts on the Caltrain Corridor is discussed in Chapter 5. This discussion has been supplemented with additional detail based on the Revised 2012 Business Plan and more information about how such a system would compare to a full-build on the Peninsula. Please refer to Standard Response 1 for a further discussion of the blended system approach.

56-117

The Authority disagrees that a blended system is a first-tier "alternative" that must be studied in a recirculated Program EIR. The blended system approach is an implementation option for a second-tier project, not a first-tier network alternative identifying the corridor that will connect the HST between the Bay Area and the Central Valley. A blended system would be evaluated as part of a project-level environmental evaluation.

Please refer to Standard Response 1 for a further discussion of the blended system approach.

56-118

The Revised 2012 Business Plan explains the value of a blended system approach for the highly urbanized "book-end" portions of the statewide HST system, including a potential section between San Francisco and San Jose. This possibility was noted in the 2008 Final Program EIR, Chapter 2. In addition, the Partially Revised Draft Program EIR, Chapter 5, explained how a blended system approach for San Francisco to San Jose would result in reduced environmental impacts as compared to a four-track, full build out HST system on the Peninsula. A more detailed evaluation of a blended system approach must be based on a more defined second-tier project. Please refer to Standard Response 1 for a further discussion of the blended system approach.

The UC Berkeley Institute for Transportation Studies (ITS) conclusions about the ridership model have been taken into consideration in the recent peer review of the forecasts by both the Authority's Independent Peer Review Panel. The Peer Review Panel has evaluated multiple factors in the model and concluded that it

performs reasonably and is an appropriate tool for planning purposes. Please refer to Response to Comment 56-109 for more on this topic.

56-119

The Authority does not agree that a blended system approach is an alternative to the first-tier project that must be studied in a recirculated Program EIR. Please refer to Response to Comment 56-117.

56-121

The blended system approach is not an alternative to the first-tier project, but rather an implementation strategy for the second-tier. Refer to Standard Response 1. The Revised 2012 Business Plan includes more information about the ridership implications of a blended approach as part of second-tier implementation of the statewide HST system.

Any ACRP operation would be on the order of 25-40 minutes slower than the most direct to San Francisco Altamont alternatives examined in the 2008 PEIR/EIS analysis. The optimal non-stop run time from Tracy for a full speed option over the Altamont Pass into San Jose in the 2008 EIR/S document is 25 minutes, without any pad for operations contingency (Appendix 4E). In the Altamont Corridor Preliminary Alternatives Analysis, Appendix E shows run times with similar assumptions for the alternatives carried forward by segment, which when added show between 45 and 60 minutes for the Tracy to San Jose segment. In addition, in San Jose the reversal of direction and the activation of control from the other cab compartment will likely add several minutes to the time normally required in the station to unload and board passengers. Thus the run times that are already slower as shown earlier for a blended Altamont A1 scenario would be a further 25-40 minutes longer. The effect of a 30 minute additional time would result in a drop in ridership for the Full System in 2030.

The Revised 2012 Business Plan indicates that a blended system approach for implementing the HST system could be an important component of the system that is profitable and would operate without a subsidy. In addition, Chapter 5 has been revised to indicate more clearly that one of the benefits of a blended system approach is that the cost of implementation is lower. More informative cost comparisons must await a definition of what infrastructure improvements are involved in a blended system, a definition that will be developed as part of second-tier environmental review. It is reasonable to infer at this level of analysis that blended system operating costs would be higher on a per train mile basis as a result of the increased train miles from the more circuitous route and the increased travel time. Capital costs would be less for the blended system then a full-build alternative on the Peninsula as a result of deferral of grade separation and track work.

As described in Response to Comment 56-124, the Altamont Corridor Rail Project San Francisco/San Jose proposal is not a reasonable alternative for study in the Program EIR. As described in Response to Comment 56-112, the additional mileage and slow speed of the proposal would result in substantially fewer riders than any of the alternatives studied in the Program EIR, with the addition of a blended assumption. (Parsons Brinckerhoff, Technical Memorandum on Alternatives Suggested in Comments on Partially Revised Draft Program EIR, April 2012.)

56-122

The Authority disagrees that the Partially Revised Draft Program EIR improperly defers full analysis of phased implementation as discussed in the Draft 2012 Business Plan. Standard Response 1 explains the environmental impacts of phased implementation of individual second-tier projects to build individual sections of the HST. Chapter 5 of the Partially Revised Draft Program EIR disclosed that the longer duration of construction than previously anticipated will lead to benefits accruing more slowly. The analysis is general, but it is not deferred.

Chapter 5 of the Partially Revised Final Program EIR has been updated with additional information related to the Revised 2012 Business Plan, which has refined the phased implementation approach for the HST system as a whole, to reduce costs, implement improvements more quickly, and achieve transportation benefits earlier. The Revised 2012 Business Plan presents facts explaining why the project benefits, even with phased implementation, make

the project worthwhile in light of costs. These facts include, among others, that HST will address the critical need for intraregional mobility within California, will reduce congestion on the state's major highways and freeways, will reduce energy use and reliance on fossil fuels, and will greatly reduce the State's greenhouse gas emissions from transportation sources.

With the phased implementation, including the blended system approach, the anticipated ridership will be lower than what is described in the program EIR. Evaluations performed to generally assess the effect of a blended system approach on ridership forecasts for the Business Plan indicate that a blended approach between San Francisco and San Jose assuming a Pacheco Pass network alternative would likely reduce total system ridership by 5% relative to the full system with higher capacity. This reduction would in general apply as well to an Altamont Pass network alternative going to San Jose and then using a blended approach to San Francisco on the Peninsula. (Parsons Brinckerhoff, Technical Memorandum on Alternatives Suggested in Comments on Partially Revised Draft Program EIR, April 2012.)

The Authority does not agree with the comment that the Business Plan ridership forecasts must be applied for the Program EIR. The Business Plan ridership forecasts are different, and lower, than the forecasts for the Program EIR because the two documents have different purposes, and there are different assumptions used in the modeling for each.

The ridership forecasts for the Business Plan support the Authority's financial and investment planning for the HST system. The orientation of the Business Plan is to assess potential positive cash flow from operation of the HST system to help estimate private sector investment. To do this, HST fares are assumed to be relatively high (83% of airfare), reducing potential ridership but increasing net revenue. Other assumptions that contribute to reducing potential ridership include conservative assumptions about future population growth and trip-making patterns.

The Program EIR, on the other hand, supports the environmental analysis the Authority must undertake to comply with CEQA. The orientation of the Program EIR is to identify reasonable, higher levels of ridership on the HST system to ensure the EIR adequately identifies and discloses adverse environmental impacts, and identifies mitigation strategies. The forecasts are based on more optimistic assumptions about future population growth than the Business Plan forecasts. In addition, the Program EIR presents a range of forecast that use a relatively low fare (50% of airfare) to describe adverse impacts, and a relatively high fare (83% of airfare) to describe beneficial impacts. The approach in the Program EIR is intended to be conservative in the depiction of both adverse impacts and project benefits.

56-123

Should the Authority select an alternative with a northern terminus at Union City BART, then project-level analysis of such an alternative would be required, including consideration of impacts on existing transit systems, stations, and service. As stated in the Partially Revised Draft Program EIR, the impact of a Union City terminus on BART service is "considered significant even with application of mitigation strategies. As second-tier, project-level environmental documents are prepared, the potential consequences of phased implementation on connecting BART service will be evaluated in more detail." (p. 5-8)

The Altamont Corridor Rail Project (ACRP), which is a separate project from the HST project, proposes regional rail service that could include a BART connection at Union City. The potential design and operation of this interface will be clarified in a Supplemental Alternatives Analysis Report currently being prepared. The impacts of the ACRP on Union City Station and BART system operations would be determined as part of a future project-level environmental analysis for the ACRP.

56-124

The comment conflates a HST project alternative involving an Altamont alignment with the Altamont Corridor Rail Project (ACRP), a distinct and different effort. The projects differ in many ways including: (1) the purpose and need, (2) the design criteria (and resulting operational features), (3) the ridership market addressed

and (4) the level of environmental analysis that has been performed to-date as well as the possible environmental effects.

The statewide HST Project has been developed for a purpose and need separate from the ACRP, which is to serve regional trips and act as a feeder to the intercity HST Project. Accordingly, the ACRP alignment represents a refinement of the original HST Altamont route (discussed in the Program EIR); with a design facilitating operating speeds lower than those of HST and avoiding impacts associated with greater speeds, including noise, vibration and requirements for additional right-of-way and structures. Through its alignment and station location alternatives, the ACRP has been developed to maximize regional ridership.

Specifically with regard to ridership potential, the ridership results for the Altamont and Pacheco alternatives evaluated in the RFPEIR and original Central Valley to Bay Area environmental document provide the only bona fide, "apples-to-apples" comparison of the potential to serve the Purpose and Need of the Statewide HST system.

However, tailoring the design of the ACRP to meet a regional trip-focused purpose and need and to avoid the additional impacts associated with HST operations necessarily diminishes objectives related to the intercity travel market addressed by the statewide HST Project, most notably travel speed and directness of routing. Thus, gains in regional ridership that would accrue to the HST Project as a result of utilizing the ACRP route would be offset by a decrease in intercity HST ridership, as compared with the use of an alignment designed solely for HST services, whether across Altamont Pass or Pacheco Pass.

The second difference between the HST Project and the ACRP is the level of environmental analysis that has been conducted to-date for each. The ACRP Preliminary Alternatives Analysis Report (PAA) does not provide a full assessment of impacts comparable to that which has been completed for the HST Project. Thus, the supposed superiority of the ACRP with respect to environmentally sensitive areas cannot be established based on existing documentation. The comment makes claims that can be substantiated only by project-level environmental analysis for the ACRP, yet to be performed. The focus and analyses of the separate ACRP and HST Projects are not equivalent, and do not support conclusions of greater ridership and fewer environmental impacts for HST on an ACRP route, as made in the comment.

The HST Program EIR, however, does provide an analysis considering the HST Altamont Route and HST Pacheco Routes as alternatives addressing the same purpose and need, and at the same level of environmental analysis. Comparing the two alternatives on equal footing, the document finds that the HST Pacheco Route minimizes impacts on wetlands, waterbodies, and the environment; exhibits operational benefits and minimizes logistical constraints; takes better advantage of investment synergies in the Caltrain Corridor; and enjoys greater political support.

The comment raises utilization of the Caltrain Corridor and political support as additional arguments in favor of an ACRP routing for HST services. The PAA characterizes the ACRP as "a regional intercity and commuter passenger rail project between Stockton and San José," and thus would not use the Caltrain Corridor, aside from a short interval between San José and Santa Clara. Political support plays an important role in minimizing local impacts and securing funding for a project, and should not be discounted as a valid evaluation criterion. Nonetheless, the political considerations referenced by the comment pertain to the HST Altamont Route, not the ACRP.

While an ACRP routing for HST would share some of the advantages of the HST Altamont Route in passing near SJC, and relieving freeway capacity constraints, other claims made in the comment cannot be supported by the ACRP's Purpose and Need or the existing analysis contained in the PAA. The ACRP, as currently defined, does not pass near SFO and is not intended to replace a BART extension to Livermore; conversely, the PAA recognizes "the need to accommodate a future planned BART extension [to Livermore]" (p. S-1). Finally, as introduced in the preceding discussion of this response, investment in the ACRP alone would not provide the same benefits to statewide and regional travel markets as an HST Pacheco Route combined with the ACRP. An "ACRP San Francisco/San José alternative" would necessarily involve compromises affecting its potential to serve both statewide and regional travel markets as

effectively as the HST Preferred Alternative in combination with the ACRP.

56-125

The description of impacts in Section 6.2 is consistent with the description of impacts provided in Section 8.5 of the 2008 Program EIR and Section 7.2 of the 2010 Revised Final Program EIR, and does not represent a change from the 2010 Revised Final Program EIR as the commenter suggests.

Furthermore, the Authority disagrees with the assertion that the newly identified impacts were not taken into consideration in the recommendation of a preferred alternative. As discussed in Section 6.2.1 of this 2012 Partially Revised Draft Program EIR, a "multitude of factors influenced the prior designation of the Pacheco Pass Network Alternative serving San Francisco via San Jose as preferred alternative in the 2008 Final Program EIR and the 2010 Revised Final Program EIR. From an environmental perspective, a critical issue was that the Pacheco Pass Network Alternative serving San Francisco via San Jose minimized impacts on wetlands, waterbodies, and the environment. This conclusion has not changed based on the new information in this document. The environmental trade-off for reducing the relative amount of residential and business displacement to implement the HST by using existing transportation corridors (Monterey Highway and Caltrain Corridor) results in noise and vibration, traffic and construction effects. On balance, these environmental impacts, while carefully considered and important, do not change the prior conclusion that the Pacheco Pass Network Alternative Serving San Francisco via San Jose results in the fewest environmental impacts overall of the network alternatives while providing direct HST service to downtown San Francisco, San Francisco Airport (SFO), and San Jose" (Pages 6-3 and 6-4). This weighing of environmental versus built environment impacts falls squarely in the context of the newly identified significant (and unavoidable) impacts.

56-126

The Authority does not agree with the comment that the Altamont Corridor Rail Project San Francisco/San Jose option is a reasonable alternative that must be studied in a revised and recirculated Program EIR. An EIR is not required to address every "imaginable" project alternative. The Program EIR has addressed a reasonable range of alternatives that has fostered informed decision making and public participation.

56-127

Comment acknowledged.

Submission 71 (Graham Kaye-Eddie, Makabusi LLC, February 24, 2012)

MAKABUSI, LLC

URBAN DESIGN, PLANNING & MANAGEMENT CONSULTANTS

2/21/2012

4005

02-27-12P01:13 RCVD

California High-Speed Rail Authority
ATTN: Mr. John Mason
770 L Street, Suite 800
Sacramento, California 95814

Via email: BayArea-CentralValley@hsr.ca.gov

RE: Partially Revised Draft Program EIR

Dear Mr. Mason,

71-477 This letter is submitted under the ruling of the California State court of appeals decision regarding the re-circulation and re-evaluation of some of the impacts of the proposed California High Speed Rail Project (Project). The Project, as currently being reviewed has areas of concern that will cause significant environmental impacts under CEQA.

Referencing Chapter 5 NEW INFORMATION AND CHANGED CONDITIONS SINCE SEPTEMBER 2, 2010, PRIOR DECISIONS, Page 5-2, we note that there are impacts regarding land use including but nor limited to, grade issues, loss of habitat, loss of Class A farmland, loss of dwellings, commercial, municipal and religious structures, noise and vibration in urban and rural settings, alignment parameters that determine routes relating **to only the steel rail line technology** (Quote from the City Of Bakersfield response to the EIR).

71-478 We are requesting the examination of an alternative technology that has not been properly examined in any environmental document that we have reviewed to date, including the current revised EIR, that as an alternative technology, magnetic levitation (maglev) Evacuated Tube Transportation (ET3) be reviewed and analyzed in light of the above mentioned impacts. The maglev is the superior environmental choice when considered in comparative assessment for less environmental impacts, as well as, many other technological factors.

We think it is appropriate to compare ET3 Maglev with CAHSR in 4 basic categories ;- Performance; Vehicle; Guideway and Cost. We have shown the specific items under each for comparative evaluation.These categories arenot mutually exclusive. Others might be included to further clarify elements deemed necessary.

Sincerely,

Graham Kaye-Eddie
Makabusi LLC

Cc: Governor Jerry Brown
David Valenstein, USDOT Federal Railroad Administration
Zachary Simmons, US Army Corps of Engineers
Renee Donato Nelson, Clean Water and Air Matter (CWAM)
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Response to Submission 71 (Graham Kaye-Eddie, Makabusi LLC, February 28, 2012)

71-477

The Authority selected steel-wheel-on-steel-rail technology as part of the certified 2005 Final Statewide Program EIR/EIS. Maglev technology was considered and rejected at that time. Maglev was eliminated since it "would not allow for direct HST service to major intercity travel markets and therefore would not meet the purpose and need and objectives for the proposed project." The selected steel-wheel-on-steel-rail technology is extensively proven in intercity operations throughout the world. This type of technology allows for sharing of tracks at reduced speeds with other compatible conventional rail services. This will also produce a greater cost savings during construction as there are a number of potential steel-wheel-on-steel-rail manufacturers able to compete for the opportunity to use their technology in California, ensuring the best product for the best price.

71-478

Refer to Response to Comment 71-477 above.