Comment Letter O012 (Stuart M. Flashman, Law Offices of Stuart M. Flashman, April 26, 2010)

O012

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

RE: Revised Draft Program EIR Material for Bay Area to Central Valley High-Speed Train Project.

Dear Mr. Leavitt:

Thank you for the opportunity to provide comments on the Revised Draft Program EIR Materials ("RDPEIRM") for the above-referenced project. These comments are provided on behalf of my clients, the California Rail Foundation, the Transportation Solutions Defense and Education Fund, and the Planning and Conservation League. As the Notice of Availability ("NOA") indicates, this material is being released pursuant to the peremptory writ of mandate served on the Authority in Sacramento County Superior Court case # 34-2008-80000022, in which my clients were plaintiffs.

The first comment my clients have concerning the RDPEIRM is regarding the denomination of the document released by the authority. The writ of mandate issued by the Court called for the Authority to, "revise the Environmental Impact Report/Environmental Impact Statement for the Bay Area to Central Valley High-Speed Train Project in accordance with CEQA, the CEQA Guidelines, and the Final Judgment entered in this case ..." Contrary to this order, the Authority has released, not a "Revised Draft Environmental Impact Report/Environmental Impact Statement", or even a "Revised Draft Environmental Impact Report", but revised draft "material." CEQA makes no provision for release of draft "material"; nor did the Court's writ of mandate. My clients presume that the document released by the Authority is intended to serve as a revised draft environmental impact report, and that, pursuant to CEQA Guidelines §15088.5(e), only those portions of the EIR that have been modified are being recirculated. O012-1

A related, but more substantial, concern with the form of the document comes from the NOA issued by the Authority, which indicates that the Authority will only respond to comments "that relate to the content of this Revised Draft Program EIR Material." My clients believe that the authority's duty to respond to comments received goes beyond the crabbed subject range identified in the NOA.[1] O012-2

The Court's judgment in the above-referenced case identified several specific flaws in the Final EIR/EIS ("FPEIR/EIS") that the Authority had previously certified. The Court's writ of mandate ordered the Authority to rescind its certification of the entire EIR, and to revise the EIR/EIS "in accordance with CEQA, the CEQA Guidelines, and the final judgment entered in this case," prior to reconsidering certification of that EIR/EIS. In other words, it is the adequacy of the entire document, not just those portions the Authority has chosen to recirculate, that must be evaluated. The appropriate standard for determining what comments must be responded to O012-3

[1] The Authority is presumably relying on CEQA Guidelines §15088.5(f)(2) and (3). However, while the CEQA Guidelines should generally be afforded great weight (*Laurel Heights Improvement Association v. Regents of the University of California* ("*Laurel Heights II*") (1993) 6 Cal.4th 1112, 1123 fn.4), deference is not called for if "a provision is clearly unauthorized or erroneous under CEQA." (*Id.*; *see also, Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98 [revisions to CEQA Guidelines held invalid when found to conflict with statute or case law].)

was laid out in *Laurel Heights II*. In that case, as here, a Final EIR had been certified and then challenged in court. As here, the court overturned the certification and remanded the EIR for revision in accordance with the court's judgment. (*Id.* at p. 1121.) In that case, unlike here, the Regents decided to prepare and release an entire new EIR. (*Id.*) The new EIR was recirculated in its entirety, receiving voluminous comments. In response, the Regents prepared a Final EIR consisting of six volumes containing more than two-thousand pages. (*Id.*) The Final EIR contained material that had not been included in either the previous Final EIR or the revised Draft EIR. However, the Regents did not recirculate this revised EIR, but instead certified it as adequate and re-approved the project. When the inevitable court challenge once again reached the California Supreme Court, the main issue before the court was when public comment on a revised EIR must be allowed and responded to when the revisions occur prior to the EIR's certification.

The Court laid out specific criteria about when revisions to an uncertified EIR must be open for public comment and agency response. These criteria are relevant because they indicate when comments on a recirculated EIR must be responded to. Significantly, the criteria the court identified are considerably broader that those that would apply under Public Resources Code §21166, which would apply if the prior EIR had already been certified without challenge. Under *Laurel Heights II*, recirculation is required if new information indicates that: a) there will be a new, previously-unidentified significant impact, b) a previously-identified impact will be significantly increased, c) there is a previously-unidentified feasible mitigation measure or alternative that would reduce project impacts, but the project sponsor declines to adopt it, or d) the prior EIR was so defective that the failure to allow additional comment would deprive the public of the opportunity to comment meaningfully. O012-3 cont.

My clients believe that each of these factors apply in the current circumstances, and consequently comments must be accepted and responded to not only for those portions of the EIR that were revised and recirculated, but also on the portions of the prior FPEIR/EIS that have been retained and are implicated by the revisions. As will be discussed further below, there are previously unidentified impacts *even beyond those identified in the RDPEIRM*. There are also previously-identified impacts that will be significantly increased, and there are previously-unidentified feasible mitigation measures and alternatives that would reduce project impacts, but which the Authority has not only failed to adopt, but has failed to even study or discuss. This new information, both that contained in the revisions and information that the revisions fail to disclose, alters the balance of impacts between alternatives, requiring that the PEIR reconsider and re-evaluate that balance.

Further, as the Court's judgment suggested, the Union Pacific Railroad's ("UPRR") refusal to allow its right-of-way to be used has rendered both the primary Altamont and primary Pacheco alignment alternatives studied in the prior FPEIR/EIS infeasible. This should have required a full reopening of the range of alternatives to be studied. Instead, the Authority only considered one alternative for each of the two major alignments – an alternative directly adjoining the previously-considered alignment. Again, this does not comport with CEQA's mandate that an EIR consider a reasonable range of alternatives, especially when the "new" proposed Altamont alternative is identified as infeasible. O012-4

In addition, new information on the ridership/revenue modeling done for the prior FPEIR/EIS calls that modeling into question and indicates that, because of those defects, the prior FPEIR/EIS was so defective as to require reopening the modeling issues for restudy. The remainder of this letter will be a more detailed analysis of the RDPEIRM and specifically its deficiencies and how those deficiencies ought to be remedied. O012-5

THE RIDERSHIP AND REVENUE MODELING IN THE PEIR NEEDS TO BE RECONSIDERED. O012-6

While the Court's judgment did not address the ridership/revenue modeling included in the prior FPEIR/EIS for the Project, that is only because there was no evidence before the Court,

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or indeed before the public or my clients, to indicate any problem with the model used to analyze the ridership and revenue expected from different project alternatives.

It is worth noting that while the modeling of ridership and revenue did not, in itself, identify any environmental impacts, it was crucial to the overall environmental analysis of the project. There are two reasons for this. First, the project purpose, as identified in the Authority's original authorization by the legislature and specified in more detail subsequently by Streets and Highways Code §§2704 et seq (Proposition 1A on the November 2008 statewide ballot), required that the system be self-supporting. (Streets & Highways Code §2704.08(c)(2)(J).) Thus, system revenue needed to be sufficient to offset system costs. Otherwise, an alternative would have to be rejected as not meeting the legislatively-mandated Project purpose. Secondly, and equally importantly, because the Project will require extensive construction and mitigation expenses, the revenue generated must be sufficient to allow financing of those costs. Otherwise, proposed mitigation measures might have to be adjudged infeasible based on excessive cost, and the corresponding impact identified as significant and unavoidable. (See, Citizens of Goleta Valley v. Board of Supervisors (1988) 197 Cal.App.3d 1167, 1181 [infeasibility can be based on alternative's additional costs being so severe as to make its implementation impractical].)

O012-6 cont.

O012-7

The previously-certified FPEIR/EIS included ridership and revenue figures obtained through a study performed by Cambridge Systematics, Inc. ("CS") under a contract with the Metropolitan Transportation Commission ("MTC"). That study resulted in numerous reports, which were transmitted to the Authority and included in the administrative record for the FPEIR. However, what was apparently not transmitted to the Authority, and most definitely was not included in the administrative record was the actual final model used to derive the ridership/revenue results included in the FPEIR/EIS. Instead, the only actual model coefficients included in the administrative records were those contained in an earlier peer-reviewed version of the model. The public, and my clients, reasonably (but, it now turns out, incorrectly) assumed that it was that published model that was used to obtain the modeling results included in the FPEIR/EIS.

In the Fall of 2009 (after the court case had already been filed, heard, and decided), the Authority released its revised business plan for the high-speed train system. That business plan included detailed ridership/revenue figures derived using the CS/MTC ridership/revenue model. Peculiarities in these results led some members of the public to seek the details of the model used to obtain the results. At the end of January 2010, after a considerable delay, the Authority released the final model coefficients. Upon review, those coefficients have turned out to be highly questionable. (See the report prepared by Mr. Norman Marshall of Smart Mobility, Inc., a professional transportation modeling consulting firm, a copy of which report is attached hereto as Exhibit A and is incorporated into this comment letter by this reference.) This, in turn, calls into question the ridership/revenue modeling results included in the prior FPEIR/EIS.

O012-8

The new information about the major flaws in the ridership/revenue modeling included in the prior FPEIR/EIS requires, under *Laurel Heights II,* that the Authority reopen the ridership/revenue modeling included in the prior FPEIR/EIS for public comment and review. That is because, in the absence of the information exposing the flaws in the model used to obtain those results, the ridership/revenue information included in the prior FPEIR/EIS was so fundamentally defective as to make the public comments submitted at that time meaningless and deprived the public of its right to comment on this important aspect of the FPEIR/EIS.

ADDITIONAL FEASIBLE ALTERNATIVES FOR BOTH THE ALTAMONT AND PACHECO ALIGNMENTS ARE AVAILABLE AND SHOULD HAVE BEEN STUDIED IN THE RDPEIRM.

O012-9

As noted above, the RDPEIRM considers only one alternative for each of the two major alignments, Altamont and Pacheco. In each case, the studied alignment is directly adjacent to the previously-considered alignment using the Union Pacific right-of-way. The RDPEIRM failed to even reconsider or compare other alternative alignments that had been identified in the prior

EIR/EIS for the Project. Further, the recirculation of the RDPEIRM is not occurring in a vacuum. During the period between the certification of the prior FPEIR/EIS and the present, the Authority has been moving forward on project-level environmental studies for both the San Francisco to San Jose and San Jose to Merced segments of the previously-approved Pacheco alignment[2]. These studies have included consideration of additional alternative alignments. Pages 18 through 22 from the Authority's October 2009 presentation on San Jose to Merced project-level alternatives, a copy of which is attached hereto as Exhibit B, indicate a variety of alternative alignments for this segment of the Project. Yet the RDPEIRM addresses only one of these alternatives, the "East of UPRR alignment" alternative. The RDPEIRM does not even provide, as required by CEQA, any explanation of why the other alternatives might be infeasible. Similarly, the RDPEIRM considers only one possible alternative for the Altamont alignment, again an alignment running near and parallel to the already-considered UPRR alignment.[3]

O012-9 cont.

O012-10

Concerned about the need to reconsider the Altamont alignment in light of the inability to use UPRR right-of-way, my clients retained a highly knowledgeable independent consulting firm to look at alternate Altamont alignments that would avoid using the UPRR right-of-way. Their report is attached hereto as Exhibit C and incorporated herein by this reference. The report identifies a new Altamont routing option, including three variations for traversing the Fremont area, that is feasible and potentially viable and would avoid impinging on UPRR's primary right-of-way.[4]

O012-11

An additional modification to the Altamont alternatives that the Authority needs to address in the RDPEIRM concerns the proposed Bay crossing at the Dumbarton rail bridge location. The prior FPEIR/EIS concluded that the existing rail bridge was unusable and that it would be infeasible to share a reconstructed/rebuilt rail bridge with the Peninsula Corridor Joint Powers Board ("PCJPB") for its proposed Transbay service[5]. Part of the reason for this was that the authority insisted that a high rail bridge was imperative to permit large ships to pass under the bridge and access ports south of the bridge. (See, FPEIR/EIS, Volume III, Responses to comments O007-22 and PH-L12-1.) The Authority assumed that the navigational channel under the Dumbarton rail bridge was in active use by large vessels, necessitating a high bridge or tunnel. However, while this may have been true at some point in the past (hence the existing high bridge for the Dumbarton highway bridge and the swing sections in the existing rail bridge), it no longer appears to be the case. As the attached email from the U.S. Coast Guard (Exhibit E hereto, incorporated herein by this reference) indicates, "very few VTS San Francisco Vessel Movement Reporting System Users (VMRS Users[6]) report transiting through the Dumbarton Bridge." It should be noted that even some vessels required to use VMRS (e.g., sightseeing tour boats) may not need a high bridge. Further, as my client's consultant points out, the existing rail bridge ship channel is 140 feet wide. The Authority's specifications for a new bridge require a

O012-12

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[2] It should be noted that the Authority strenuously insisted that the project-level environmental studies move forward while the flaws in the programmatic EIR were corrected. It cannot now pretend that the results of those studies do not exist.

Included in O012-9

[3] One of the three alignment options does require the use of a little-used minor right-of-way segment owned by UPRR. However, unlike the prior UPRR right-of-way options, which UPRR specifically rejected, the UPRR has, in the past, proved to be amenable to selling off such little-used right-of-way segments. Until this option is explored further, it cannot be assumed that UPRR will oppose such a sale here. Consequently, this alternative cannot be rejected out-of-hand as infeasible.

Included in O012-10

[5] To the extent the infeasibility depends on the proposed Caltrain bridge being single-track, there is no structural impediment to constructing a two track bridge, so long as the Authority agreed to pay the upgrade costs for adding a second track. Further, as the attached letter from Anthony Waller (Exhibit D hereto) indicates, there is no technical reason why a two track bridge need be incompatible between Caltrain and high-speed rail equipment. To the extent incompatibility is based on current FRA regulations, Mr. Waller's letter points out that Caltrain already has a petition pending before the FRA for a waiver of that requirement, and indications are that the waiver will be granted, as has already happened for similar Southern California mixed diesel/electric rail traffic.

Included in O012-11

[4] Coast Guard regulations require all large vessels (e.g., powered vessels more than 131 feet in length, towing vessels more than 26 feet in length, and commercial passenger ships carrying 50 or more passengers) report their position using the VMRS.

Included in O012-12

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295 foot wide channel. No justification is provided for requiring a further widening beyond what is currently available, and the widening seems particularly inappropriate given the lack of large ship traffic through the channel. With a narrower, 140 foot wide channel, other bridge options would be available, including a swing bridge or simple draw bridge. If the 295 foot channel is found not to be necessary, these additional options, which would greatly reduce bridge costs, should be investigated. In any case, the high bridge proposed in the FPEIR/EIS (see FPEIR/EIS Figure 3.9-22 [AR B004295], copy attached as Exhibit F) appears far in excess of what is needed. My clients' consultant indicates that in their estimation the cost for a new high bridge of similar design to the existing Dumbarton highway bridge should not be such as to make the option problematic. The EIR needs to address this new information of changed circumstances and re-evaluate the cost and practicability of a new, two-track Dumbarton rail bridge.

O012-12 cont.

It is all the more imperative that additional alternatives be examined because the one alternative picked by the Authority as its new preferred alternative, the East of UPRR Pacheco Pass alternative, is identified as having newly-identified significant traffic impacts. As the analysis below shows, even the significant and unavoidable impacts identified for this alternative in the RDPEIRM understate this alternative's actual significant impacts. Consequently, the revised EIR must give full consideration to other feasible alternatives that might avoid or lessen these significant impacts. (See CEQA Guidelines §15126.6(b).)

O012-13

An additional reason for the Authority to consider additional alternatives is the pending lawsuit *Peterson v California High-Speed Rail Authority* (Sacramento County Superior Court case no. 2010-00069687). That case is based on the trackage agreement between the Peninsula Corridor Joint Powers Board ("PCJPB") –i.e, Caltrain, and UPRR[7] governing the use of the Caltrain right-of-way between San Francisco and San Jose. A copy of that trackage agreement is attached hereto as Exhibit G. Under Section 2.1 of that agreement, UPRR retains the perpetual and exclusive right to conduct intercity passenger rail service over the Caltrain-owned trackage. The lawsuit contends that the PCJPB currently has no agreement with UPRR that would allow the Authority to conduct intercity passenger rail operations over the trackage covered by the agreement. Given UPRR's expressed concern about protecting its ability to maintain and expand its freight operations through the Peninsula (see letters from UPRR to the Authority, dated July 7, 2008 and February 23, 2009, copies of which have been included in the RDPEIRM as part of Appendix C), it seems unlikely that UPRR will agree to allow the Authority to run intercity passenger service on the Peninsula using the trackage rights UPRR controls. This raises an issue, the need for a non-Caltrain right-of-way alternative through the Peninsula, that is very similar to the issue addressed in the *Atherton* case which led to the need for the current RDPEIRM. Under these circumstances, it would seem imperative that the authority identify feasible alternatives not involving the use of Caltrain/UPRR right-of-way through the Peninsula.

O012-14

The Authority, in its prior FPEIR/EIS, considered and rejected two alternative alignments through the Peninsula: one along Highway 101 on the east side of the Peninsula, the other along Interstate Highway 280, a more westerly alignment. Given the need for an alternative to the Caltrain/UPRR right-of-way alignment, my clients also asked their consultant to evaluate having the alignment run along Highway 101. That evaluation is also included in the attached report (Exhibit C). The evaluation indicates, contrary to the authority's previous conclusion, that a Highway 101 alignment from the Dumbarton Bay crossing northward to San Francisco airport is in fact feasible and offers some significant benefits. My clients would therefore ask that the authority re-evaluate a Highway 101 alignment option for use with the Altamont alternative.

O012-15

THE RDPEIRM FAILS TO FULLY DISCLOSE THE IMPACTS OF THE ONE PACHECO PASS ALTERNATIVE ANALYZED IN DETAIL.

O012-16

As noted, the RDPEIRM analyzes in detail one Pacheco Pass alternative alignment, an alignment running just east of the UPRR right-of-way south of San Jose. This alignment avoids

[7] The agreement was originally made between the PCJPA and Southern Pacific Transportation Company. Southern Pacific's interest in the agreement was subsequently transferred, along with other property interests, to UPRR.

Included in O012-14

using UPRR right-of-way, in part by displacing two lanes of the Monterey Highway, reducing that roadway from six lanes to four. The RDPEIRM identifies that this lane reduction results in a significant an unavoidable traffic impact on that roadway. However, what the RDPEIRM fails to disclose are significant traffic impacts to other roadways to which traffic is displaced by the congestion on the Monterey Highway.

The RDPEIRM includes a traffic analysis prepared by the City of San Jose using its traffic modeling software. This software, like many such traffic models, includes an algorithm that automatically shifts traffic from areas of higher congestion to other routings with less congestion. The result of this shift is that congestion on the most congested roadway segment is decreased, but traffic on other alternative routings increases, potentially causing secondary congestion impacts. In fact, analysis of the modeling done for the RDPEIRM (see attached report, Exhibit H, incorporated herein by this reference) shows that the reduction in the width of the Monterey Highway from six lanes to four in order to accomodate the high-speed rail right-of-way outside of the UPRR right-of-way not only increases congestion on that highway, but also causes some of the excess traffic to leave the Monterey Highway in favor of other parallel alternative routes, overloading those routes and causing secondary congestion impacts. In particular, the following alternative routings experience significant secondary congestion impacts as a result of the lane removal on the Monterey Highway: the Bayshore Freeway, U.S. 101, The West Valley Freeway, SR 85, the Guadadupe Parkway, SAR 87, and I-280.

O012-16 cont.

The RDPEIRM also provides an inconsistent project description for this portion of the project. At page 2-11, the RDPEIRM states: "For the HST project, segments of Monterey Highway from Umbarger Road to Metcalf Road (near Bailey Road) are proposed to be narrowed from six lanes to four lanes to provide a cost-effective right-of-way corridor for HST by minimizing property acquisition along the HST alignment." However, the immediately preceding sentence states: "As discussed above in the Affected Environment, Monterey Highway in the San Jose to Central Valley Corridor is six lanes wide from Southside Drive to Blossom Hill Road, and four lanes wide south of Blossom Hill Road." (RDPEIRM p. 2-11). Since Metcalf Road is south of Blossom Hill Road, the RDPEIRM appears to be calling for this roadway section to be reduced from six lanes to four, while also asserting that it is already four lanes.. This discrepancy must be resolved so that readers can have a clear and unambiguous project description that allows them to understand the nature and significance of project changes and resulting impacts.

O012-17

A related modeling issue is the lane capacities used in modeling the Monterey Highway traffic impacts. As the consultant report points out, the lane capacities appear to change abruptly south of Blossom Hill Road. North of Blossom Hill Road, the lane capacity appears to be 950 vehicles per lane per hour, for a total capacity of 2850 vehicles in each direction. South of that point, however, the apparent lane capacity abruptly increases to 1450 vehicles per lane per hour, or a total travel capacity of 2900 vehicles. No explanation is given for this change, which appears suspiciously convenient for the Authority's plans for lane removal. The RPEIR should either make the lane capacities consistent or provide an explanation for the change in lane capacity.

O012-18

Another set of impacts not fully disclosed by the RDPEIRM is the increased noise and vibration impacts caused by moving the right-of-way east of the UPRR right-of-way. For portions of the San Jose to Gilroy segment of the alternative, and specifically those portions between Lick in San Jose and Gilroy, the new proposed alignment is shifted significantly closer to residences than was the prior alignment. (See RDPEIRM Figure PP-6B.) In addition, the new alignment also shifts portions of the Monterey Highway closer to residences. (See RDPEIRM Figure PP-6C.) It can only be expected that these shifts will increase the noise and vibrational impacts of the rail line and highway compared to the prior alignment proposal. However, the RDPEIRM fails to include any analysis of the noise and vibrational impacts of the revised alignment. By failing to do so, the RDPEIRM fails to consider or discuss the potentially significant increase in noise and vibrational impacts, and fails to consider whether mitigation measures might reduce those impacts.

O012-19

Comment Letter O012 - Continued

A third set of impacts not fully disclosed in the RDPEIRM is the increased land use, noise, and property impacts associated with use of the Caltrain right-of-way alignment through the San Francisco Penninsula. The RDPEIRM notes that the addition of two high-speed rail tracks over the length of the Peninsula would require the acquisition of additional right-of-way in some areas. (RDPEIRM at p. 6-2.) However, the RDPEIRM fails to indicate that there will also be a need for acquisition of additional temporary right-of-way for "shoo-fly" or bypass tracks to accommodate rail traffic while existing trackage is worked on. The expansion to a full four-track system means that the high-speed rail tracks will be moved incrementally closer to adjoining residences and businesses, increasing the severity of noise and vibrational impacts. It also means that there will be times when there will be cumulative noise impacts, where a high-speed rail trainset passes on one set of tracks while a Caltrain trainset is passing on the other. However, the RDPEIRM fails to include any analysis of the effect of these changes on the noise or vibrational impacts of the project. It also fails to evaluate the impact of this acquisition of additional temporary right-of-way on historic trees, both in terms of visual impacts, biological impacts, and the likely extremely high severance costs (i.e., property impact) associated with such acquisition. O012-20

The RDPEIRM takes an ambiguous stance towards impacts on UPRR's freight operations. On the one hand, the RDPEIRM asserts that, the application of proposed mitigation stategies, along with negotiations with UPRR, "are expected to ensure that HST alignment alternatives will not result in adverse impacts to UPRR freight operations." (RDPEIRM at p. 4-9.) On the other hand, on the preceeding page the RDPEIRM states that the impact on UPRR freight operations, "must be considered potentially significant out of an abundance of caution." O012-21

The RDPEIRM asserts, without any detailed analysis or explanation, that there would be no impact on UPRR freight operations along the Caltrain corridor between San Francisco and San Jose. (RDPEIRM at p. 4-4.) While the RDPEIRM includes "mitigation strategies" intended to address project impacts, it provides no explanation about how these strategies will avoid impacting UPRR freight operations, and specifically UPRR customer spurs, between San Francisco and San Jose. For the San Jose to Gilroy segment, the RDPEIRM admits that for at least one spur north of Gilroy, the high-speed rail alignment would run at grade, cutting off an existing UPRR spur. (*Id.*) Despite identifying this specific impact, the RDPEIRM provides no corresponding specific mitigation measure. O012-22

The RDPEIRM argues that the project would have no impact on UPRR's ability to add new spurs in the future; this in spite of the fact that the project will likely physically cut off the UPRR mainline from businesses it might want to serve at a future time. The RDPEIRM's argument against the significance of this change is that, "there is currently no prohibition to acquiring property adjacent to existing privately-owned railroad right-of-way." In other words, since UPRR doesn't yet own the land that might contain the spur, it has no protection against losing the ability to later add a spur. That may be true, but there is an enormous difference between there being the *potential* for a spur to be blocked and approving a project that will *very likely* block the potential spur site. In view of the UPRR's stated intention of expanding its freight service in the future and adding new spurs, and the potential of these blockages preventing businesses from being served by the rail line, forcing them to rely on more energy-intensive truck transport for delivery of goods and supplies, this change should be identified as a potentially significant impact. O012-23

Finally, the potential for UPRR freight trainsets and high-speed rail trainsets to be operating on adjacent tracks (See, e.g., RDPEIRM Figures PP-6A through 6C) may require the installation of crashwalls to separate the two operations and protect against impacts from derailments or similar upsets. The figures in the RDPEIRM do not show any crash walls, nor does the text indicate that provisions have been made for their inclusion. Further, the alignment descriptions do not discuss such walls or indicate how much space they would occupy. If crashwalls have not already been provided for, they should be added, and their costs included in project cost estimates or an explanation given for why they are not needed to avoid impacts from derailments or other upsets. (See PCJPB report on failure modes and their mitigation, attached O012-24

hereto as Exhibit I[8].) If crashwalls are already part of the proposed alignment alternatives, they need to be shown on the diagrams, cross-sections, and descriptions, including adjusting the needed right-of-way requirements, property impacts, and project costs. O012-24 cont.

THE NEED TO RE-EVALUATE ALTAMONT VS PACHECO ALIGNMENT ALTERNATIVES FOR THEIR POTENTIAL IMPACTS REOPENS THE RECORD FOR ADDITIONAL INFORMATION ON THOSE IMPACTS

The prior FPEIR/EIS evaluated a variety of potential impacts from the previously-considered Altamont and Pacheco alignment alternatives. The Court evaluated the evidence on those impacts and concluded that, for many of them, the Authority's determination to certify the FPEIR/EIS was supported by substantial evidence. However, at this point the certification of the prior FPEIR/EIS has been rescinded *in its entirety*, as have the Authority's findings in support of that certification. Further, the Authority now has before it different alternatives to be evaluated. Consequently, the Authority must consider the adequacy of the PEIR and its supporting evidence *de novo*, and it is appropriate in making that determination that the Authority consider all of the evidence in the record, including evidence submitted after the prior FPEIR/EIS certification. In that regard, my clients are submitting herewith additional evidence that bears on the analysis of impacts and the characteristics of project alternatives in regards to biological impacts and operational characteristics of different alternatives. O012-25

THE ANALYSIS OF BIOLOGICAL IMPACTS IN THE PEIR, AS REVISED, IS INADEQUATE AND MUST BE REVISED.

The RDPEIRM contains no additional information on the biological impacts of any of the alternatives examined. Presumably, that is because the Authority intends to continue to rely on the analysis of biological impacts contained in the prior FPEIR/EIS. Presumably, the Authority's reliance is based on the fact that the new alternatives closely follow the alignment of previously-analyzed alternatives. As my clients have already pointed out, the Authority's approach violates CEQA in failing to consider other feasible alternatives that might reduce or avoid significant project impacts. Even looking at the limited range of alternatives included in the RDPEIRM, however, the Authority must reconsider whether the analysis of biological impacts in the prior FPEIR/EIS remains adequate. My clients' position is that it does not. O012-26

Attached hereto as Exhibit J and incorporated herein by this reference is a report prepared by a qualified biological consultant evaluating the analysis of biological impacts contained in the prior FPEIR/EIS. As the report notes, there are a wide variety of protocols that can provide an adequate evaluation of biological and ecological values and, based on that, the potential impacts of a project on those values. Such protocols can be applied at the programmatic, as well as the project level. Unfortunately, the prior FPEIR/EIS applied none of these standard protocols. Instead, the FPEIR/EIS conducted an extremely cursory summary review of some of the available information on biological resources located along the various alternatives. The prior FPEIR/EIS did not even attempt to standardize the information it presented to assure that it was "comparing apples to apples." The FPEIR/EIS justified its cursory evaluation on the fact that this was a programmatic analysis, and promised more detailed study at the project level, *after a final alignment had been chosen*. The fallacy is that deferring a full analysis of biological resources and biological impacts to the project level meant that the choice of alignments was made without the necessary pertinent information about the impact of different alternatives. As the consultant's report points out, the cursory analysis performed by the Authority essentially amounted to no analysis at all, and provided no meaningful information on the nature or extent of project impacts or the feasibility of their mitigation. Without this baseline level of

[8] The report notes that while a crash involving one or more Caltrain cars and a derailed freight car is unlikely, the consequences of such a crash would be catastrophic. The potential for such crashes cannot, therefore, be ignored. While Caltrain and UPRR freight operations are currently temporally separated, the expansion of HSR operations would make that mitigation option far less feasible, and increasingly unattractive to UPRR. Included in O012-24

Comment Letter O012 - Continued

information and analysis, the Authority's choice of the Pacheco Pass alignment was, in terms of biological impacts, no more than a "shot in the dark," in violation of CEQA's mandate that evaluation of project impacts include "alterations to ecological systems." (CEQA Guidelines §15126.2.) In order to evaluate such alterations, it is first necessary to adequately characterize the existing ecological conditions. (See, CEQA Guidelines §15125(c).) The analysis in the prior FPEIR/EIS failed to do this. It is therefore imperative that the PEIR be revised to include an adequate study and analysis of biological and ecological resources, how they would be impacted by the various alternatives, and feasible mitigation measures to reduce any significant impacts that are identified. Given that this is a programmatic document, the analysis need not include excessive detail, but it must include sufficient evidence and analysis to allow the identification of significant impacts and potential mitigation measures.

O012-26 cont.

THE PEIR'S ANALYSIS OF OPERATIONAL CHARACTERISTICS FOR THE ALTAMONT ALIGNMENT ALTERNATIVE NEEDS TO BE REVISED TO REFLECT THE REALITY OF CURRENT HIGH-SPEED TRAIN OPERATIONS PRACTICES.

The prior FPEIR/EIS analyzed the Altamont alignment alternatives under the assumption that a single train could only go to one destination. As a consequence, train frequencies to/from San Francisco and San Jose were reduced by roughly ½ with concomitant reduction in projected ridership [9]. While my clients stated, in comments on the DPEIR/EIS, that European train operations allowed multiple trainsets to travel in tandem over large segments of a route with coupling/decoupling allowing multiple origins or destinations, the Authority's response was that such operations would have highly negative impacts on travel time and were therefore highly disfavored and rarely used in existing high-speed rail systems.

O012-27

My clients asked their consultants, who are experts on European high-speed rail operations, to address this question. Their response, included in the already-referenced Exhibit C, indicates that, to the contrary such operations are accomplished quickly and efficiently, and therefore are commonly used under precisely the type of circumstance that would occur during access to the Bay Area – where trains travel a relatively long distance on a common routing, but start or end their journey at two separate locations. Because the coupling/decoupling is done electronically, there is little time lost doing the process[10], while there is a great benefit from being able to simultaneously run trainsets with differing origins or destinations along the same track with reduced operator costs and increased frequency and passenger capacity. Based on this evidence, the operational analysis for the Altamont alternatives should be revised to adjust train frequencies based on allowing train splitting and joining, and the ridership and revenue figures recalculated under the new operational parameters.

Thank you for considering these comments on the RDPEIRM. Please keep me, and my clients, informed of future developments on this project.

Most sincerely,

Stuart M. Flashman

[9] As explained earlier in this letter, this was compounded by the flawed ridership modeling, which gave undue influence to frequency of service.
[10] The coupling process takes approximately five minutes, while decoupling takes only roughly three minute.

Included in O012-27

Attached Exhibits:

- A: Revenue and Ridership Modeling Report
- B: CAHSRA October 2009 presentation on alternative alignments
- C: Altamont alternatives report
- D: Letter from A. Waller re: Caltrain/HSR operations on a Dumbarton rail bridge
- E: Coast Guard e-mail concerning Dumbarton ship traffic
- F: Photosimulation showing Authority's proposed Dumbarton high rail bridge
- G: PCJPB – UPRR Trackage Agreement
- H. Monterey Highway Narrowing Traffic Analysis
- I: PCJPB analysis of potential passenger train accidents
- J: Evaluation of Biological Values and Impacts Analysis

Comment Letter O012 - Continued

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in O012-8

smart mobility

Memorandum

To: David Schonbrunn, TRANSDEF
From: Norm Marshall
Subject: California High-speed Rail Model Coefficients Review
Date: April 26, 2010

I have reviewed the "final coefficients and constants in the HSR Ridership & Revenue Model" attached to the memorandum from George Mazur of Cambridge Systematics to Nick Brand dated January 29, 2010, plus March 2010 memos from Mazur and from the California High-Speed Rail Authority, and Bay Area/California High-Speed Rail Ridership and Revenue Study reports from the period 2005-2007.

As described in the March 2010 memo from the California High-Speed Rail Authority, a travel demand model was used to develop ridership and revenue forecasts:

> A travel demand model is a tool for making predictions about people's travel patterns. A model consists of a series of mathematical equations that produce forecasts of the number, origin and destination, travel mode, and travel route for trips as a function of variables such as population and employment, travel time and cost, fuel costs, rail and airline schedules, and a number of other variables. The mathematical equations in the model include coefficients and constants that describe the importance of each input variable in a traveler's decisions regarding the number of trips, destination, travel mode, and travel route. Typically, the mathematical equations, including the constants and coefficients, reside in computer software files that are used to apply the model. In applying the model, assumed values for the variables are input to the model, and the computer software applies the mathematical equations to these assumed values in order to make travel predictions. In the following [comments], the word "model" specifically refers to the mathematical equations, including the coefficients and constants, and does not include the assumed values that are input to the model.[1]

Based on my expertise and experience as documented in the attached C.V., I find:

1) The model coefficients used in developing the ridership and revenue forecasts are different than those disclosed to the public during the 2007 environmental review period.
2) The final frequency (headway) coefficients used in developing the ridership and revenue forecasts are invalid.
3) The use of these invalid frequency (headway) coefficients biases the alternatives analyses in favor of the Pacheco Alignment (P1) as compared to the Altamont alignment (A1).
4) Mode-specific constants were misrepresented during the public review process.
5) The mode-specific constants in the final model that were used to forecast ridership and revenue are invalid.

I provide support for these findings in the sections below.

[1] Memorandum from George Mazur to Mehdi Morshed, Executive Director of the California High-Speed Rail Authority regarding "dHigh-Speed Rail Ridership and Revenue Model, p. 1, March 3, 2010.

1

O012
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High-speed Rail Model Misrepresented to Public during the Environmental Review Process

The California High-Speed Rail ridership and revenue forecasts are derived directly from a set of computer models. Information about these models was presented to the public in a series of project publications published between 2005 and 2007.[2] In 2010, it was disclosed that the final project reports misrepresented the model that was used to develop the ridership and revenue forecasts. Many model coefficients were different between the published model and the model that was applied, but I focus on two set of coefficients that are particularly significant – 1) coefficients related to train service frequency, and 2) mode-specific constants that capture any bias between the attractiveness of different travel modes (auto, high-speed rail, conventional rail and air) that is not captured in other model variables.

An important attribute of high-speed rail service is the frequency of service. If all other things are equal, higher frequency (trains more often) will attract higher ridership. The critical modeling question is: how much higher ridership? Answering this question was a focus of the survey and model development process. When urban transit service is frequent, e.g. every 10 minutes, modelers assume that travelers will arrive randomly without attention to the schedule. With 10-minute frequency, also referred to as a 10-minute headway, modelers assume an average wait time of one half the headway, or 5 minutes. With less frequent scheduled service, and particularly with service where advance ticket purchase is likely or even required (including air travel), travelers do not arrive randomly between departures. The summary of the second (and final) peer review meeting in June 2006 states:

> Frequency is included in the mode choice models directly rather than the traditional wait times, calculated as half the headway, because frequency has a different impact on interregional travel than it does on urban travel. Wait times were estimated separately based [on] direction from the peer review panel:[3]

As a result, the magnitude of the frequency effect was estimated from an extensive traveler survey. In March 2010, the California High-Speed Rail Authority reiterated the importance of the survey work, stating:

> Model development was supported by new transportation survey data and existing data from regional transportation agencies, the census, and other sources. The new survey effort included over 10,000 "stated-preference choice exercises" that allow the resulting model to predict travel demand for the new high-speed rail travel option. All aspects of this survey effort, including the sampling plan, followed state-of-the-practice guidelines and were vetted through peer review. The new transportation surveys are discussed in High-Speed Rail Study Survey Documentation (December 2005).[4]

[2] I have reviewed several of these reports including: *Findings from Second Peer Review Panel Meeting: Final Report* (July 2006), *Interregional Model System Development: Final Report* (August 2006), *Statewide Model Validation Final Report* (July 2007), *Ridership and Revenue Forecasts: Final Report* (July 2007), and *Findings from First [sic] Peer Review Panel Meeting* (actually third peer review report with no meeting, September 2007).

[3] Cambridge Systematics, Inc. with Mark Bradley Research and consulting and SYSTRA Consulting, Inc. Bay Area/California High-Speed Rail Ridership and Revenue Forecasting Study: *Findings from Second Peer Review Panel Meeting: Final Report*, p. 4-14, July 2006.

[4] Morshed 2010, p. 2.

2

Comment Letter O012 - Continued

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The frequency (headway) coefficients estimated from the survey data indicate that:

> "The value of frequency (headway) is significant for all segments, but is only about 20 percent as large as the in-vehicle time coefficient." (Final model development report [also called "Task 5a report"], August 2006).[5]

This same exact sentence is replicated in the project final report and in a recent peer-reviewed journal article about the modeling.

> "The value of frequency (headway) is significant for all segments, but is only about 20 percent as large as the in-vehicle time coefficient." (Final project report, July 2007)[6]

> "The value of frequency (headway) is significant for all segments, but is only about 20 percent as large as the in-vehicle time coefficient." (Peer-reviewed journal article published in March 2010)[7]

This 20 percent value is reasonable. It implies that adding an additional one hour between train departures will have the same effect on ridership as increasing the travel time on the train by 12 minutes. The question as to what values are reasonable will be discussed in greater depth in the "High-Speed Rail Model Coefficients are Invalid" section below.

Details in the August 2006 final model report provide detailed model coefficients, and indicate for long distance trips, the ratio of the frequency coefficient to the in-vehicle time coefficient is 0.21 for work trips and 0.24 for other trips. (Table 3-15, p. 3-37) These numbers are a more precise presentation of the information provided in the July 2007 project final report as "about 20 percent."

The first instance where any information was provided to the public that was different than "about 20 percent" was in a January 29, 2010 memo.[8] Attached to this memo were model coefficients that were very different from those presented earlier, and also inconsistent with the model description in the July 2007 final project report. The January 2010 information does not state so explicitly, but it can be inferred that instead of basing the frequency coefficients on the survey data, it instead was assumed that the ratio between frequency and in-vehicle time was 100%, or about 5 times as much as indicated by the survey data.[9] The memo also states that: "The client, MTC, elected not to update the Task 5a report nor to include the final coefficients and constants in the final project report."

[5] Cambridge Systematics, Inc. with Mark Bradley Research and Consulting, Bay Area/California High-Speed Rail Ridership and Revenue Forecasting Study: *Interregional Model System Development: Final Report*, p. 3-36, August 2006.

[6] Cambridge Systematics, Inc. with Corey, Canapary & Glanis, Mark Bradley Research and Consulting, HLB Decision Economics, Inc., SYSTRA Consulting, Inc., and Citilabs. Bay Area/California High-Speed Rail Ridership and Revenue Forecasting Study: Final Report, p. 5-7, July 2007.

[7] Outwater, Maren, Kevin Tierney, Mark Bradley, Elizabeth Sall, Arun Duppam and Vamsee Modugula. "California Statewide Model for High-Speed Rail", p. 74, Journal of Choice Modelling, March 2010, 3(1) pp. 58-83.

[8] Memo, George Mazur of Cambridge Systematics to Nick Brand re "Final Coefficients and Constants in HSR Ridership and Revenue Model, January 29, 2010

[9] The coefficients attached to the January 29, 2010 Mazur memo included one case where the ratio was 1000%, but the California High-Speed Rail Authority later indicated that was a typographical error.

3

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In the March 2010 California High-Speed Rail Authority memo cited earlier, Morshed makes an unsupported assertion that the information was somehow available to the public earlier.

> While the final constants and coefficients had not been compiled into summary table format prior to the January 29, 2010 memorandum, the information contained in the tables has been publicly available in a different form since 2007.

One can only speculate as to what is intended by this statement, but it appears to be a reference to the model itself; i.e. if the public suspected that the model was inconsistent with the published reports, that the model could have been requested and examined. Even in this scenario, discovering the discrepancies would have been a significant undertaking for the public. As the California High-Speed Rail Authority itself stated when transmitting the January 2010 memo and correct coefficients:

> "… this material as presented did not previously exist and significant amounts of sub-consultant staff time went into preparing it."[10]

In reality, the correct model information simply was not available to the public until 2010. There clearly was ample time within the environmental review process to properly disclose the model information. The March 2010 California High-Speed Rail Authority memo states that there were no changes to model coefficients after February 7, 2007.[11] Nevertheless, the July 2007 project final report restates the 20 percent ratio. There also are no mentions of any coefficient changes in the September 2007 third peer review report.[12] This suggests that even the peer reviewers were not informed about the changes. Table 1 summarizes the entire chronology.

[10] Morshed 2010, p. 2-3.

[11] Morshed 2010, p. 2

[12] Cambridge Systematics, Inc.. Bay Area/California High-Speed Rail Ridership and Revenue Forecasting Study: *Findings from First [sic] Peer Review Panel Meeting*, September 2007.

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Table 1: Chronology of Disclosure of Frequency Coefficient Information

Date	Document	Frequency/in-vehicle time ratio info
July 2006	2nd Peer Review meeting report	Estimate frequency coefficient rather than using half the headway
August 2006	Interregional Model System Development Final Report	"about 20 percent as large as the in-vehicle time coefficient" and ratios of 0.21 for long work trips and 0.24 for long other trips
February 2007	Morshed 2010, p. 2	Date when Cambridge Systematics and California High-speed Rail Authority state that coefficients were finalized
July 2007	Overall Final Report	"about 20 percent as large as the in-vehicle time coefficient"
September 2007	3rd Peer Review report (no meeting)	No mention of issue
March 2008	Journal article submitted	Presumably includes text and table numbers same as in March 2010 published version
December 2008	Journal article revisions submitted	Presumably includes text and table numbers same as in March 2010 published version
January 29, 2010	Cambridge Systematics memo	Discloses coefficients showing headway/in-vehicle time ratios of 1.0 and 10.0
March 2010	Journal article published	"about 20 percent as large as the in-vehicle time coefficient" and table with 0.21 and 0.24
March 3, 2010	Cambridge Systematics memo	Highlights typographical error in January 29 memo
March 3, 2010	California High-speed Rail Authority memo	States that "procedures, coefficients, and constants have remained unchanged since February 7, 2007"

Prior to 2010, the mathematical underpinnings of the HSR ridership and revenue forecasts were never disclosed to the public or to regulatory authorities, creating the false presumption that the previously documented coefficients and constants had been used to develop the forecasts.

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High-speed Rail Model Coefficients are Invalid

As discussed above, the report from the second peer review meeting described estimating the frequency coefficients from the survey data, independent of headway/wait time. This June 2006 meeting was attended by nine peer review members:

- Ayalew Adamu (California Department of Transportation (Caltrans) Headquarters);
- Jean-Pierre Arduin (independent consultant);
- Chris Brittle (independent consultant representing MTC);
- Billy Charlton (San Francisco County Transportation Authority (SFCTA));
- Kostas Goulias (University of California at Santa Barbara);
- Keith Killough (Southern California Association of Governments (SCAG));
- Frank Koppelman (Northwestern University);
- Chausie Chu (Los Angeles County Metropolitan Transportation Authority (Metro)); and
- Kazem Oryani (URS Corporation).[13]

Especially notable in this group is Frank Koppelman who is a leading expert in mode choice modeling from stated preference data. Koppelman and Bhat have authored a guide to model estimation from which two short excerpts are reprinted below. The first excerpt discusses the use of ratios in model testing.

> The ratio of the estimated travel time and travel cost parameters provides an estimate of the value of time implied by the model; this can serve as another important informal test for evaluating the reasonableness of the model… Similar ratios may be used to assess the reasonableness of the relative magnitudes of other pairs of parameters. These include out of vehicle time relative to in vehicle time, travel time reliability (if available) relative to average travel time, etc.[14]

The focus on the ratio between frequency (headway) and in-vehicle time is a typical use of this type of reasonableness testing. If the ratio is reasonable, this adds confidence concerning the validity of the model. The second excerpt discusses "constraining" coefficients.

> Two approaches are commonly taken to identify a specification which is not statistically rejected by other models and has good behavioral relationships among variables. The first is to examine a range of different specifications in an attempt to find one which is both behaviorally sound and statistically supported. The other is to constrain the relationships between or among parameter values to ratios which we are considered reasonable. The formulation of these constraints is based on the judgment and prior empirical experience of the analyst. Therefore, the use of such constraints imposes a responsibility on the analyst to provide a sound basis for his/her decision. The advice of other more experienced analysts is often enlisted to expand and/or support these judgments.[15]

[13] Cambridge Systematics et. al. July 2007, p. ES1 – ES2.

[14] Koppelman, Frank S. and Chandra Bhat. A Self Instructing Course in Mode Choice Modeling: Multinomial and Nested Logit Models, p. 78-79. Prepared for U.S. Department of Transportation, Federal Transit Administration 2006.

[15] Koppelman and Bhat 2006, p. 112.

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In the original model, the estimated frequency (headway) coefficients were all highly statistically significant[16], so lack of statistical fit was not a basis for constraining the coefficients. Nevertheless, in the final California High-Speed Rail model, the frequency (headway) coefficients were constrained to 100 percent of the in-vehicle time coefficient. This implies that the effect of an additional hour between train departures on ridership is just as great as an additional hour on the train. This is contrary to common sense, and if true, would cancel out much of the rationale of high-speed train service. Instead, it likely would be cheaper just to add more frequent conventional train service. If the survey data resulted in this 100 percent ratio, it would be necessary to give it some credence, but as discussed above, the survey data indicate the ratio to be about 20 percent, or one fifth as great. As in the Koppelman and Bhat excerpt, constraining a coefficient rather than estimating it " imposes a responsibility on the analyst to provide a sound basis for his/her decision." No such "sound basis" has been provided anywhere, even to this day.

In the journal article published in 2010, a sentence was added that did not appear in an earlier draft or in similar paragraphs in earlier project reports. After the sentence about the 20 percent ratio, it states:

> This coefficient was constrained to match in-vehicle time based on comments from the peer review panel.[17] (p. 74)

This statement cannot be reconciled with the timeline presented in Table 1. The second peer review meeting was in June 2006, and no such comments are included there. There were no further peer review meetings. Only three of the nine who attended the June 2006 meeting participated in email communications summarized in the third peer review report, and Koppelman was not one of those who participated. The third peer review report contains nothing concerning this issue.

To summarize this section:

1) The final model includes an assumption that the time between trains is just as important as the time on the train in determining ridership.
2) There is no documentation for this assumption and no basis provided for it.
3) The assumption is contrary to the empirical results obtained from a large survey conducted at great cost for this project.
4) The assumption violates both common modeling practice and common sense.
5) The technical authors continued to publish the original coefficients in a refereed journal article[18] after the model had been changed.
6) The final coefficients used in developing the ridership and revenue forecasts are invalid.

[16] Cambridge Systematics, Inc. with Mark Bradley Research and Consulting, August 2006, Table 3-15, p. 3-37.

[17] Outwater et. al. 2010, p. 74.

[18] Outwater et. al. 2010, p. 75, Table 5 and Footnote 3.

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Invalid High-Speed Rail Model Coefficients Biased Comparison of Alternatives

The Altamont alternative (A1) was modeled with trains divided between San Jose and San Francisco destinations. Therefore, this alternative has lower frequency (higher headways) on the northern end than the Pacheco alternative (P1). The ridership and revenue study identified this factor as a primary cause for the lower ridership forecast for the Altamont Alternative as compared to the Pacheco alternative.

> The annual boardings forecast for the Altamont and Pacheco baseline HST alternatives are presented in Table 2.1. Overall the Pacheco alternative (P1) has higher projected ridership with over 93 million expected annual boardings compared to 87.9 million for the Altamont alternative (A1). The preference of the P1 alternative is most pronounced in the Bay Area and Southern California due to quicker travel times between these two regions. The Altamont alternative suffers from the division of service between San Jose and San Francisco termini once trains enter the Bay Area. The split effectively doubles the average train headways into and out of the Bay Area for individual stations resulting in decreased ridership. The Altamont Alternative produces more boardings in the Sacramento and Stockton area due to shorter travel time to the Bay Area compared to the Pacheco Alternative.[19]

As discussed above, the frequency (headway) effect in the final model is five times as great as indicated by the survey data or in the model information presented to the public during the environmental review process. This results in underestimated ridership for the Altamont alternative (A1) relative to the Pacheco alternative (P1). These biased ridership and revenue numbers contributed to the selection of the P1 alternative over the A1 alternative.

Mode-Specific Constants Were Misrepresented during the Public Review Process

The mode choice model determines how passengers travel based on the relative attractiveness of each alternative mode: auto, conventional rail, high-speed rail and air travel. Ideally, all of the differences between modes can be expressed as a function of service attributes including travel time and travel cost. In practice, there always are some residual effects between modes that are not captured in the service attributes. These residual effects are incorporated into the model as mode-specific constants. It is preferable that the constants do not dominate the model. This can be tested by dividing the mode-specific constant by the in-vehicle time coefficient to calculate an equivalent number of minutes. For example, if a mode-specific constant is 60 times the in-vehicle time coefficient (in minutes), it is equivalent to one hour of additional in-vehicle time (abbreviated as IVT equiv.).

[19] Cambridge Systematics, Inc.. Bay Area/California High-Speed Rail Ridership and Revenue Forecasting Study: *Ridership and Revenue Forecasts: Final Report*, p. 2-1 -2.2, July 2007.

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There are three sets of published mode-specific constants for the California high-speed rail modeling: 1) model development constants (August 2006), 2) validation report constants (July 2007) and 3) the final constants disclosed in January, 2010.

Table 2 presents the mode-specific constants given in the model development report for long commute/business and long recreation/other trips. Table 3 presents the mode-specific constants given in the *Statewide Model Validation* report for these same trip categories. Both tables convert these numbers into the equivalent number of travel minutes. Although there are no firm rules, the magnitude of the Table 3 constants in IVT equivalent minutes appear high relative to that which is desirable, and there is a danger that they may be dominating the service characteristics effects. The magnitude in IVT equivalent minutes is much high in Table 3 than in Table 2. For example, in the case of high speed rail for long-distance business trips, the model penalty relative to auto changed from 22 minutes in model development to 326 minutes in the Model Validation report.

Table 2: Mode-Specific Constants for Long Trips Reported in Model Development Report[20]

	Business/Commute		Recreation/Other	
	constant	IVT equiv. (min.)	constant	IVT equiv. (min.)
Auto (constant 0 by convention)	0	0	0	0
Air	-1.645	103	0.6898	-63
Conventional Rail	-0.387	24	0.6149	-56
High-Speed Rail	-0.3503	22	1.434	-130
Note: in-vehicle time coefficient (minutes)		-0.016		-0.011

Table 3: Mode-Specific Constants for Long Trips Reported in Validation Report[21]

	Business/Commute		Recreation/Other	
	constant	IVT equiv. (min.)	constant	IVT equiv. (min.)
Auto (constant 0 by convention)	0	0	0	0
Air	-7.5062	417	-3.0858	281
Conventional Rail	-3.9738	221	1.6557	-151
High-Speed Rail	-5.8600	326	-0.1807	16
Note: in-vehicle time coefficient (minutes)		-0.018		-0.011

[20] Cambridge Systematics, Inc. with Mark Bradley Research and Consulting, August 2006, Table 3-15, p. 3-37.

[21] Cambridge Systematics, Inc. and Mark Bradley Research and Consulting, August 2006, Table 3.15 p. 3-37.

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The final set of mode-specific coefficients for long trips disclosed in January 2010 shown below in Table 4 are very different from those in the July 2007 *Statewide Model Validation* report. According to the California High-Speed Rail Authority, there were no changes to model coefficients and constants after February 2007.[22] Therefore there is no justification for the discrepancy between the validation report and the final coefficients. Note the dramatic changes in the IVT equivalents for the air constants, while the rail alternatives changed only slightly. Also, there were significant changes in the Recreation/Other column for High-Speed Rail.

Table 4: Mode-Specific Constants for Long Trips Disclosed in January 2010[23]

	Business/Commute		Recreation/Other	
	constant	IVT equiv. (min.)	constant	IVT equiv. (min.)
Auto (constant 0 by convention)	0	0	0	0
Air				
High income most* air travel	-4.089	227	0.317	-29
Low income most* air travel	-5.269	293	0.317	-29
Conventional Rail				
High income	-4.007	223	2.010	-183
Low income	-4.620	257	1.272	-116
High-Speed Rail				
High income	-5.610	312	-0.713	65
Low income	-6.757	375	-0.713	65
Note: in-vehicle time coefficient (minutes)		-0.018		-0.011

*99% of modeled air travel uses these or higher mode-specific constants

[22] Morshed 2010, p. 2.

[23] Mazur 2010.

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Unlike the constants in Tables 2 and 3, the constants in Table 4 are different for low-income and high-income travelers. These differences are relatively small. However, there also are larger underlying differences that are too complicated to be illustrated in Table 4. These involve 48 different "dummy variable" adjustment factors for airport pairs (Figure 1).

Figure 1: Airport-to-Airport Dummy Variables in Final Model Coefficients[24]

Table 3.15. Main Mode Choice Models

Variable	Acronym	Definition	Coefficient / Constant Applied for Mode				Long Trip			
			Car	Air	Conv. Rail	High Speed Rail	Business / Commute		Recreation / Other	
							Coefficient	t-stat	Coefficient	t-stat
Level of Service Coefficients										
1	cost	Cost ($)	x	x	x	x	-0.017	-12.8	-0.035	-18.5
2	time	In-vehicle time (minutes)	x	x	x	x	-0.018	Constr	-0.011	-14.0
3	rel	Reliability (Percent on time)	x	x	x	x	0.023	Constr	0.005	1.9
4	freq	Service headway (minutes)		x	x	x	-0.179	-191.0	-0.011	-14.7
5	accs	Access mode choice: ogsum					0.136	3.4	0.204	3.7
6	egrs	Egress mode choice: ogsum					0.171	3.9	0.399	7.1
7	accs<=5	Access mode choice: ogsum less than -5? (0/1)								
8	egrs<=5	Egress mode choice: ogsum less than -5? (0/1)								
9	freq>60	Service headway greater than 60 minutes? (0/1)								
10	rel<=50	Reliability greater than 50 percent? (0/1)								
Constants										
104	c-group	Traveling in a group? (0/1)	x				1.086	4.6	1.430	9.1
105	c-nocars	Zero car household? (0/1)	x							
106	c-cars<2	Fewer than 2 cars for household size greater than 1? (0/1)	x						-0.506	-2.3
107	c-hhsize	Household size	x				0.182	1.2	0.296	4.4
108	c-hinc	High income household? (0/1)	x							
200	a-const	Mode constant		x			-10.269	Constr	-4.683	Constr
207	a-lonc	Low income household? (0/1)		x						
208	a-hinc	High income household? (0/1)		x			1.180	4.6		
209	a-misnc	Missing income household? (0/1) (for model estimation only)		x						
210	a-nocars	Traveling in a zero car? (0/1)		x			-0.356	-2.8	-0.506	-3.7
211	(lax-sfo)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
212	(sfo-lax)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
213	(lax-oak)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
214	(oak-lax)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
215	(lax-sjc)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
216	(sjc-lax)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
217	(lax-sac)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
218	(sac-lax)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
221	(bur-sfo)	Airport interchange served? (0/1)		x			4.151	Constr	4.151	Constr
222	(sfo-bur)	Airport interchange served? (0/1)		x			5.363	Constr	5.363	Constr
223	(bur-oak)	Airport interchange served? (0/1)		x			2.032	Constr	2.032	Constr
224	(oak-bur)	Airport interchange served? (0/1)		x			4.145	Constr	4.145	Constr
225	(bur-sjc)	Airport interchange served? (0/1)		x			3.757	Constr	3.757	Constr
226	(sjc-bur)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
227	(bur-sac)	Airport interchange served? (0/1)		x			5.622	Constr	5.622	Constr
228	(sac-bur)	Airport interchange served? (0/1)		x			1.421	Constr	1.421	Constr
231	(ont-sfo)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
232	(sfo-ont)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
233	(ont-oak)	Airport interchange served? (0/1)		x			2.233	Constr	2.233	Constr
234	(oak-ont)	Airport interchange served? (0/1)		x			2.269	Constr	2.269	Constr
235	(ont-sjc)	Airport interchange served? (0/1)		x			3.263	Constr	3.263	Constr
236	(sjc-ont)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
237	(ont-sac)	Airport interchange served? (0/1)		x			5.907	Constr	5.907	Constr
238	(sac-ont)	Airport interchange served? (0/1)		x			3.787	Constr	3.787	Constr
241	(ana-sfo)	Airport interchange served? (0/1)		x			4.652	Constr	4.652	Constr
242	(sfo-ana)	Airport interchange served? (0/1)		x			2.409	Constr	2.409	Constr
243	(ana-oak)	Airport interchange served? (0/1)		x			-0.231	Constr	-0.231	Constr
244	(oak-ana)	Airport interchange served? (0/1)		x			-2.852	Constr	-2.852	Constr
245	(ana-sjc)	Airport interchange served? (0/1)		x			4.348	Constr	4.348	Constr
246	(sjc-ana)	Airport interchange served? (0/1)		x			2.963	Constr	2.963	Constr
247	(ana-sac)	Airport interchange served? (0/1)		x			3.571	Constr	3.571	Constr
248	(sac-ana)	Airport interchange served? (0/1)		x			-1.996	Constr	-1.996	Constr
251	(san-sfo)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
252	(sfo-san)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
253	(san-oak)	Airport interchange served? (0/1)		x			1.704	Constr	1.704	Constr
254	(oak-san)	Airport interchange served? (0/1)		x			1.962	Constr	1.962	Constr
255	(san-sjc)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
256	(sjc-san)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
257	(san-sac)	Airport interchange served? (0/1)		x			5.000	Constr	5.000	Constr
258	(sac-san)	Airport interchange served? (0/1)		x			5.686	Constr	5.686	Constr

[24] Mazur 2010.

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For the less popular air markets, the dummy variable structure suppresses the air share of travel to very small numbers. [25] The inclusion of these widely-variable "fudge factors" calls model validity into question as the model should handle both long and short trips without these adjustments. Would unknown adjustments be needed to match high-speed rail shares?

The *Statewide Model Validation* report states that the model is able to match observed air boardings closely: "The three largest markets match boardings with observed boardings within +/- 2 percent and the overall total air trips match observed boardings within +/- 1 percent."[26] Serious questions are raised about this statement given the revelation that the final mode-specific constants do not match those reported in this report, and that the final mode-specific constants include airport-to-airport adjustment factors. The use of such factors would make achieving a good model fit a trivial exercise, and therefore such a statement would not engender the level of confidence that it otherwise would. Questions include:

- Were the mode-specific constants in the *Statewide Model Validation* report used to produce the base year travel estimates in the *Statewide Model Validation* report?
- If the reported constants were used and were validated, why were they later changed?
- Have the final model constants been validated?
- If the final constants reported in January 2010 were used in the validation effort, then why weren't they reported accurately and why wasn't the use of airport-to-airport adjustment factors disclosed in 2007?

No matter what the answers to these questions are, it is clear that the model constants were not properly disclosed to the public during the environmental review process.

Final Mode-Specific Constants Are Invalid for Forecasting

The final mode-specific constants in Table 4 show high-speed rail as less attractive than either air or conventional rail for both business and non-business travel. Furthermore, the differences are large. For business travelers, the preference for air over high-speed rail is equivalent to 83-85 minutes of travel[27] (depending on income). More inexplicably, the preference for conventional rail over high-speed rail is equivalent to 89-119 minutes. For non-business travelers the preference for air over high-speed rail is 94 minutes, and the preference for conventional rail over high-speed rail is 180-248 minutes. If all three non-auto modes are available (air, conventional rail and high-speed rail), and service characteristics are identical (in-vehicle time, out-of-vehicle time, cost, frequency, etc.), high-speed rail will have the smallest mode share of the three modes modeled.

These numbers make absolutely no sense and cannot be justified by the model development process. The original mode-specific constants (Table 2) showed no such bias against high-speed rail. In the constants estimated from the stated preference data, high-speed rail is more attractive than either conventional rail

[25] The final model includes a high negative base constant for air that is partially offset by large positive constants for the most popular air markets. These factors vary widely, but the net airport-to-airport air constants in the final model (after adding the base constant to the airport-to-airport dummy) are equal to or higher than the values shown in Table 4 for 99 percent of the modeled air boardings (for all major long distance airport pairs). Most of these interchanges include a dummy adjustment of + 5.0

[26] Cambridge Systematics, Inc. with Mark Bradley Research and Consulting, July 2007, p. 6-3.

[27] Subtract one IVT equivalent from another to see the preference.

Comment Letter O012 - Continued

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or air travel. Compared to conventional rail, the preference for high-speed rail is equivalent to 3 minutes for business travelers and 74 minutes for non-business travelers. Compared to air, the preferences are equivalent to 72 minutes (business) and 67 minutes (non-business).

It is common to adjust mode-specific constants to make models better match base ridership data. Therefore, it was appropriate to adjust the constants for air and conventional rail to match observed mode shares. If those adjustments were significant, it would also have been necessary to adjust the high-speed rail constants as well, but these adjustments need to be consistent across modes. There is no justification for switching high-speed rail from being the most attractive non-auto mode to being the least attractive. It is especially absurd that high-speed rail could be modeled as less attractive than conventional rail if service characteristics were identical. The final model constants are invalid for forecasting.

Conclusions

The California high-speed rail ridership and revenue forecasts used in the selection of a preferred alignment were based on modeling that was misrepresented and that was invalid. Specifically:

1) The model coefficients used in developing the ridership and revenue forecasts are different than those disclosed to the public during the environmental review period.

2) The final frequency (headway) coefficients used in developing the ridership and revenue forecasts are invalid.

3) The use of these invalid frequency (headway) coefficients biases the alternatives analyses in favor of the Pacheco Alignment (P1) as compared to the Altamont alignment (A1).

4) Mode-specific constants were misrepresented during the public review process.

5) The mode-specific constants in the final model that were used to forecast ridership and revenue are invalid.

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smart mobility

Resume

NORMAN L. MARSHALL, PRINCIPAL

nmarshall@smartmobility.com

EDUCATION:

Master of Science in Engineering Sciences, Dartmouth College, Hanover, NH, 1982
Bachelor of Science in Mathematics, Worcester Polytechnic Institute, Worcester, MA, 1977

PROFESSIONAL EXPERIENCE:

Norm Marshall helped found Smart Mobility, Inc. in 2001. Prior to this, he was at Resource Systems Group, Inc. for 14 years where he developed a national practice in travel demand modeling. He specializes in analyzing the relationships between the built environment and travel behavior, and doing planning that coordinates multi-modal transportation with land use and community needs.

Regional Land Use/Transportation Scenario Planning

Chicago Metropolis Plan and Chicago Metropolis Freight Plan (6-county region)— developed alternative transportation scenarios, made enhancements in the regional travel demand model, and used the enhanced model to evaluate alternative scenarios including development of alternative regional transit concepts. Developed multi-class assignment model and used it to analyze freight alternatives including congestion pricing and other peak shifting strategies. Chicago Metropolis 2020 was awarded the Daniel Burnham Award for regional planning in 2004 by the American Planning Association, based in part on this work.

Envision Central Texas Vision (5-countyregion)—implemented many enhancements in regional model including multiple time periods, feedback from congestion to trip distribution and mode choice, new life style trip production rates, auto availability model sensitive to urban design variables, non-motorized trip model sensitive to urban design variables, and mode choice model sensitive to urban design variables and with higher values of time (more accurate for "choice" riders). Analyzed set land use/transportation scenarios including developing transit concepts to match the different land use scenarios.

Mid-Ohio Regional Planning Commission Regional Growth Strategy (7-county Columbus region)—developed alternative future land use scenarios and calculated performance measures for use in a large public regional visioning project.

Baltimore Vision 2030—working with the Baltimore Metropolitan Council and the Baltimore Regional Partnership, increased regional travel demand model's sensitivity to land use and transportation infrastructure. Enhanced model was used to test alternative land use and transportation scenarios including different levels of public transit.

Chittenden County (2060 Land use and Transportation Vision Burlington Vermont region) – leading extensive public visioning project as part of MPO's long-range transportation plan update.

Burlington (Vermont) Transportation Plan – Leading team developing Transportation Plan focused on supporting increased population and employment without increases in traffic by focusing investments and policies on transit, walking, biking and Transportation Demand Management.

Transit Planning

Regional Transportation Authority (Chicago) and Chicago Metropolis 2020 – evaluating alternative 2020 and 2030 system-wide transit scenarios including deterioration and enhance/expand under alternative land use and energy pricing assumptions in support of initiatives for increased public funding.

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Capital Metropolitan Transportation Authority (Austin, TX) Transit Vision – analyzed the regional effects of implementing the transit vision in concert with an aggressive transit-oriented development plan developed by Calthorpe Associates. Transit vision includes commuter rail and BRT.

Bus Rapid Transit for Northern Virginia HOT Lanes (Breakthrough Technologies, Inc and Environmental Defense.) – analyzed alternative Bus Rapid Transit (BRT) strategies for proposed privately-developing High Occupancy Toll lanes on I-95 and I-495 (Capital Beltway) including different service alternatives (point-to-point services, trunk lines intersecting connecting routes at in-line stations, and hybrid).

Central Ohio Transportation Authority (Columbus) – analyzed the regional effects of implementing a rail vision plan on transit-oriented development potential and possible regional benefits that would result.

Essex (VT) Commuter Rail Environmental Assessment (Vermont Agency of Transportation and Chittenden County Metropolitan Planning Organization)—estimated transit ridership for commuter rail and enhanced bus scenarios, as well as traffic volumes.

Georgia Intercity Rail Plan (Georgia DOT)—developed statewide travel demand model for the Georgia Department of Transportation including auto, air, bus and rail modes. Work included estimating travel demand and mode split models, and building the Departments ARC/INFO database for a model running with a GIS user interface.

Roadway Corridor Planning

Hudson River Crossing Study (Capital District Transportation Committee and NYSDOT) – Analyzing long term capacity needs for Hudson River bridges which a special focus on the I-90 Patroon Island Bridge where a microsimulation VISSIM model was developed and applied.

State Routes 5 & 92 Scoping Phase (NYSDOT) —evaluated TSM, TDM, transit and highway widening alternatives for the New York State Department of Transportation using local and national data, and a linkage between a regional network model and a detailed subarea CORSIM model.

Twin Cities Minnesota Area and Corridor Studies (MinnDOT)—improved regional demand model to better match observed traffic volumes, particularly in suburban growth areas. Applied enhanced model in a series of subarea and corridor studies.

Developing Regional Transportation Model

Pease Area Transportation and Air Quality Planning (New Hampshire DOT)—developed an integrated land use allocation, transportation, and air quality model for a three-county New Hampshire and Maine seacoast region that covers two New Hampshire MPOs, the Seacoast MPO and the Salem-Plaistow MPO.

Syracuse Intermodal Model (Syracuse Metropolitan Transportation Council)—developed custom trip generation, trip distribution, and mode split models for the Syracuse Metropolitan Transportation Council. All of the new models were developed on a person-trip basis, with the trip distribution model and mode split models based on one estimated logit model formulation.

Portland Area Comprehensive Travel Study (Portland Area Comprehensive Transportation Study)—Travel Demand Model Upgrade—enhanced the Portland Maine regional model (TRIPS software). Estimated person-based trip generation and distribution, and a mode split model including drive alone, shared ride, bus, and walk/bike modes.

Chittenden County ISTEA Planning (Chittenden County Metropolitan Planning Organization)—developed a land use allocation model and a set of performance measures for Chittenden County (Burlington) Vermont for use in transportation planning studies required by the Intermodal Surface Transportation Efficiency Act (ISTEA).

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Research

Obesity and the Built Environment (National Institutes of Health and Robert Wood Johnston Foundation) – Working with the Dartmouth Medical School to study the influence of local land use on middle school students in Vermont and New Hampshire, with a focus on physical activity and obesity.

The Future of Transportation Modeling (New Jersey DOT)—Member of Advisory Board on project for State of New Jersey researching trends and directions and making recommendations for future practice.

Trip Generation Characteristics of Multi-Use Development (Florida DOT)—estimated internal vehicle trips, internal pedestrian trips, and trip-making characteristics of residents at large multi-use developments in Fort Lauderdale, Florida.

Improved Transportation Models for the Future—assisted Sandia National Laboratories in developing a prototype model of the future linking ARC/INFO to the EMME/2 Albuquerque model and adding a land use allocation model and auto ownership model including alternative vehicle types.

Critiques

C-470 (Denver region) – Reviewed express toll lane proposal for Douglas County, Colorado and prepared reports on operations, safety, finances, and alternatives.

Intercounty Connector (Maryland) – Reviewed proposed toll road and modeled alternatives with different combinations of roadway capacity, transit capacity (both on and off Intercounty Connector) and pricing.

Foothills South Toll Road (Orange County, CA) – Reviewed modeling of proposed toll road.

I-93 Widening (New Hampshire) – Reviewed Environment Impact Statement and modeling, with a particular focus on induced travel and secondary impacts, and also a detailed look at transit potential in the corridor.

Stillwater Bridge – Participated in 4-person expert panel assembled by Minnesota DOT to review modeling of proposed replacement bridge in Stillwater, with special attention to land use, induced travel, pricing, and transit use.

Ohio River Bridges Projects– Reviewed Environmental Impact Statement for proposed new freeway bridge east of Louisville Kentucky for River Fields, a local land trust and historic preservation not-for-profit organization.

PUBLICATIONS AND PRESENTATIONS (partial list)

Understanding the Transportation Models and Asking the Right Questions. Lead presenter on national Webinar put on by the Surface Policy Planning Partnership (STTP) and the Center for Neighborhood Technologies (CNT) with partial funding by the Federal Transit Administration, 2007.

Sketch Transit Modeling Based on 2000 Census Data with Brian Grady. Presented at the Annual Meeting of the Transportation Research Board. Washington DC, January 2006, and *Transportation Research Record*, No. 1986, "Transit Management, Maintenance, Technology and Planning", p. 182-189, 2006.

Travel Demand Modeling for Regional Visioning and Scenario Analysis with Brian Grady. Presented at the Annual Meeting of the Transportation Research Board, Washington DC, January 2005, and *Transportation Research Record*, No. 1921, "Travel Demand 2005", p. 55-63, 2006.

Chicago Metropolis 2020: the Business Community Develops an Integrated Land Use/Transportation Plan with Brian Grady, Frank Beal and John Fregonese, presented at the Transportation Research Board's Conference on Planning Applications, Baton Rouge LA, April 2003.

Smart Mobility, Inc. • Norwich, Vermont • www.smartmobility.com • 802-649-5422

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smart mobility

Chicago Metropolis 2020: the Business Community Develops an Integrated Land Use/Transportation Plan with Lucinda Gibson, P.E., Frank Beal and John Fregonese, presented at the Institute of Transportation Engineers Technical Conference on Transportation's Role in Successful Communities, Fort Lauderdale FL, March 2003.

Evidence of Induced Travel with Bill Cowart, presented in association with the Ninth Session of the Commission on Sustainable Development, United Nations, New York City, April 2001.

Induced Demand at the Metropolitan Level – Regulatory Disputes in Conformity Determinations and Environmental Impact Statement Approvals, Transportation Research Forum, Annapolis MD, November 2000.

Evidence of Induced Demand in the Texas Transportation Institute's Urban Roadway Congestion Study Data Set, Transportation Research Board Annual Meeting, Washington DC: January 2000.

Subarea Modeling with a Regional Model and CORSIM" with K. Kaliski, presented at Seventh National Transportation Research Board Conference on the Application of Transportation Planning Methods, Boston MA, May 1999.

New Distribution and Mode Choice Models for Chicago with K. Ballard, Transportation Research Board Annual Meeting, Washington DC: January 1998.

"Land Use Allocation Modeling in Uni-Centric and Multi-Centric Regions" with S. Lawe, Transportation Research Board Annual Meeting, Washington DC: January 1996.

Multimodal Statewide Travel Demand Modeling Within a GIS with S. Lawe, Transportation Research Board Annual Meeting, Washington DC: January 1996.

Linking a GIS and a Statewide Transportation Planning Model, with L. Barbour and Judith LaFavor, Urban and Regional Information Systems Association (URISA) Annual Conference, San Antonio, TX, July 1995.

Land Use, Transportation, and Air Quality Models Linked With ARC/INFO. with C. Hanley, C. Blewitt, and M. Lewis, Urban and Regional Information Systems Association (URISA) Annual Conference,: San Antonio, TX, July 1995.

Forecasting Land Use Changes for Transportation Alternative with S. Lawe, Fifth National Conference on the Application of Transportation Planning Methods, Seattle WA, April 1995.

Forecasting Land Use Changes for Transportation Alternatives, with S. Lawe, Fifth National Conference on the Application of Transportation Planning Methods (Transportation Research Board),: Seattle WA, April 1995.

Integrated Transportation, Land Use, and Air Quality Modeling Environment with C. Hanley and M. Lewis Fifth National Conference on the Application of Transportation Planning Methods (Transportation Research Board), Seattle WA, April 1995.

MEMBERSHIPS/AFFILIATIONS

Member, Institute of Transportation Engineers
Individual Affiliate, Transportation Research Board
Member, American Planning Association
Member, Congress for the New Urbanism

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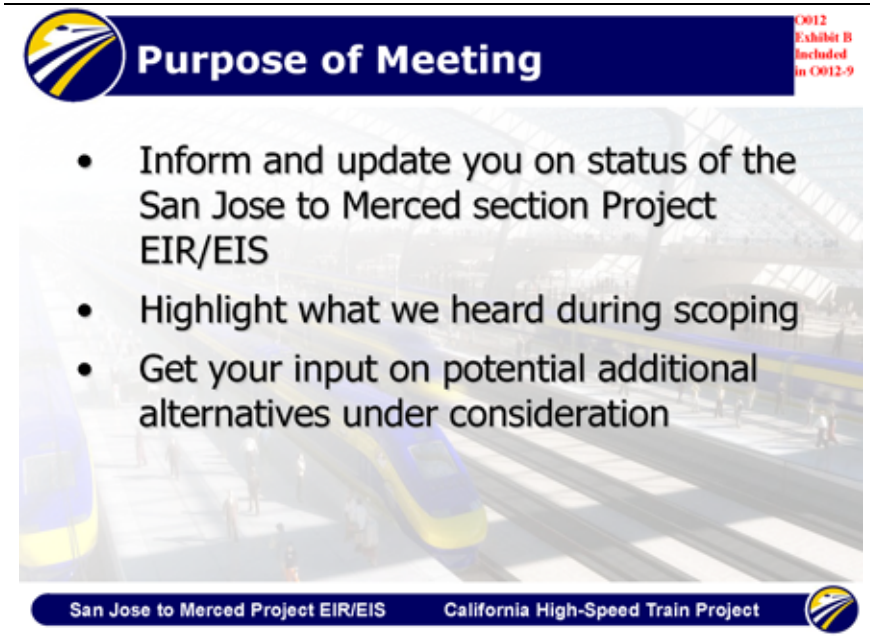

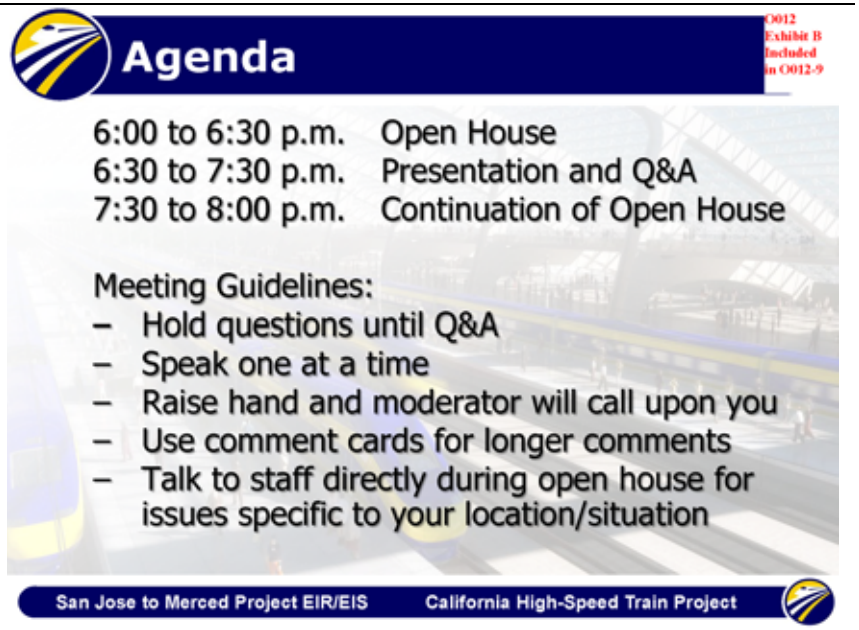

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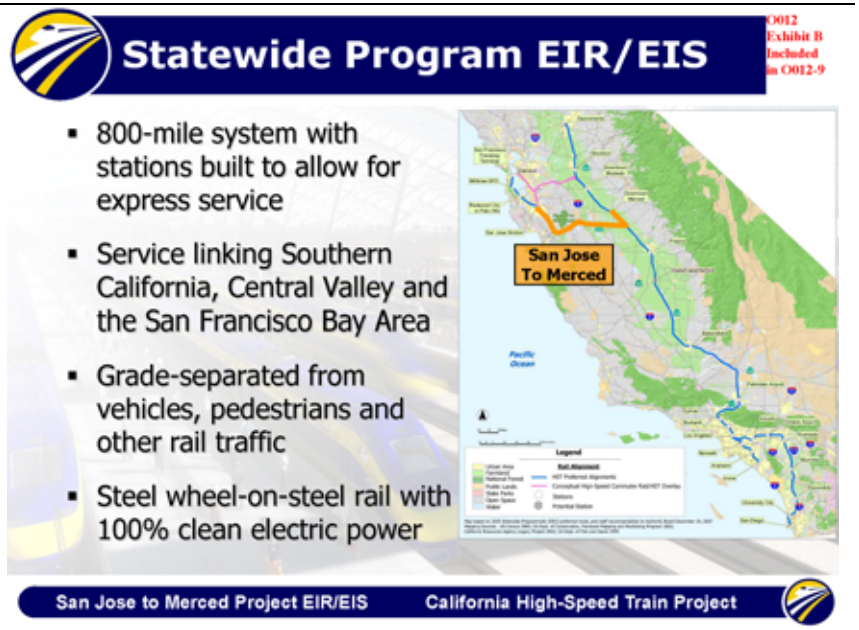

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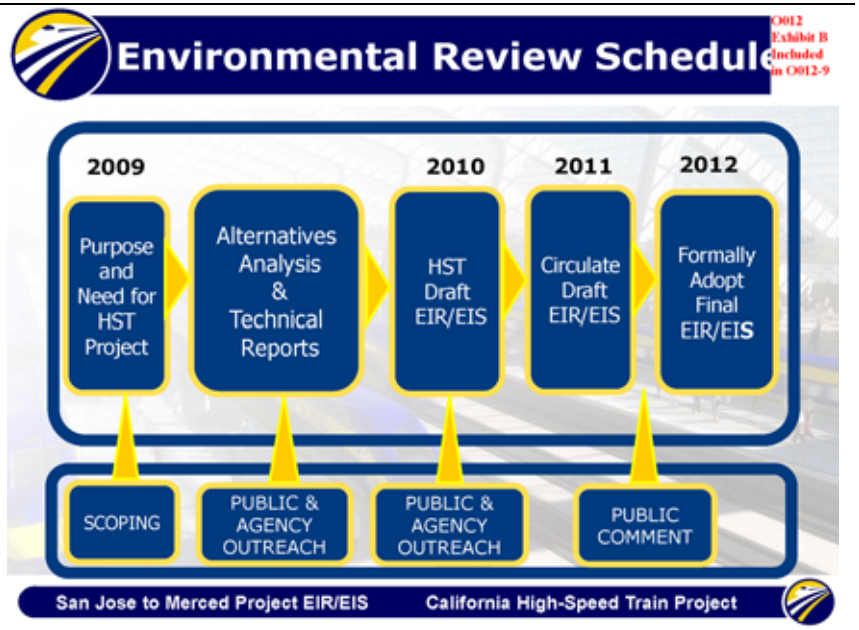

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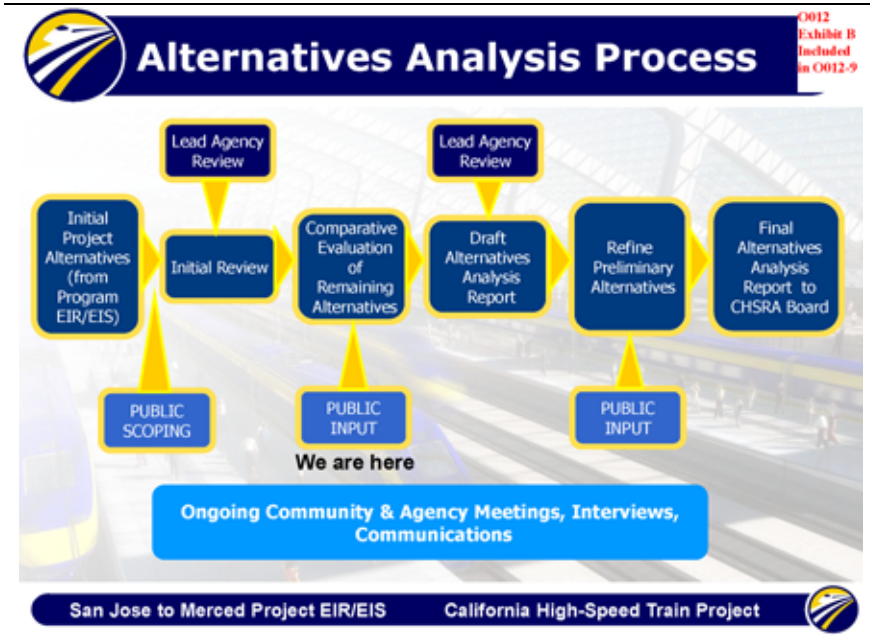

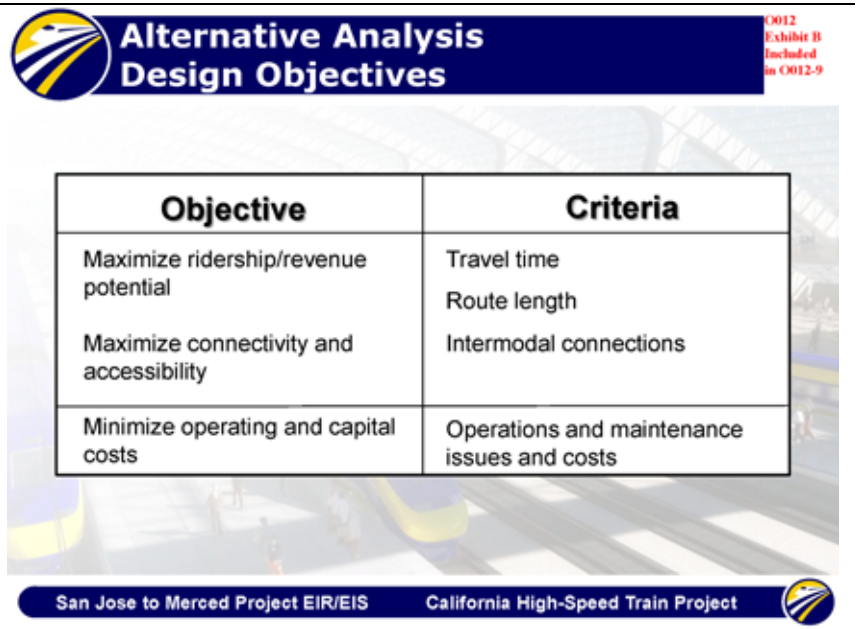

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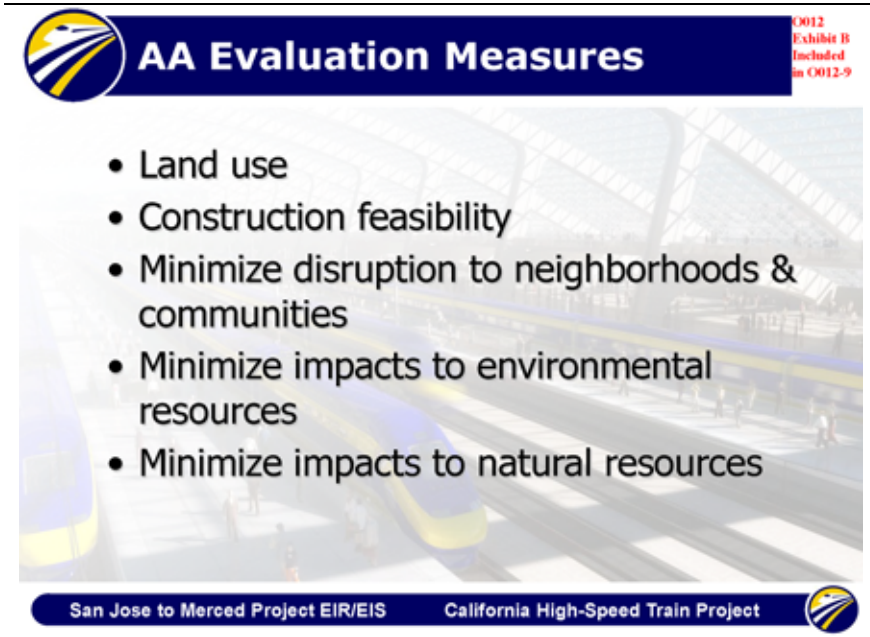

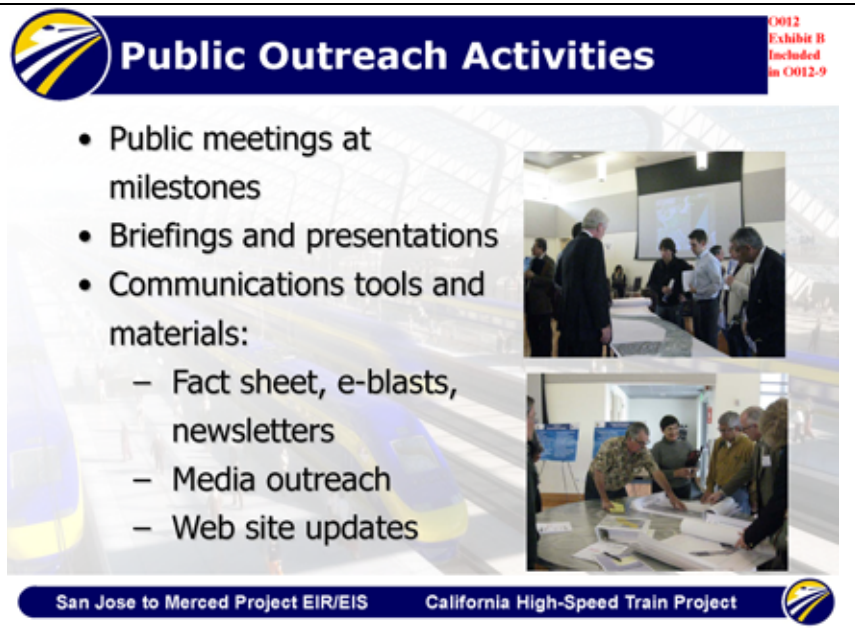

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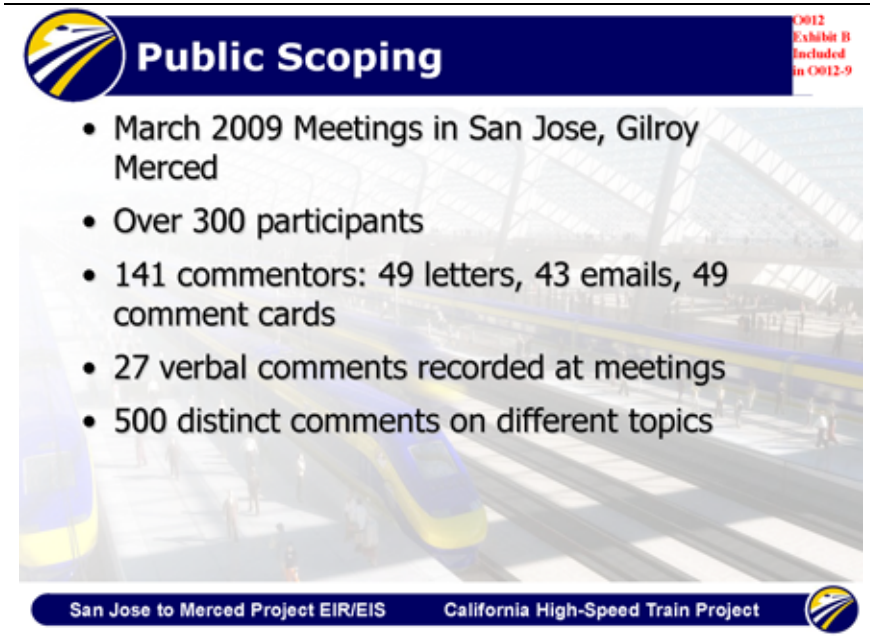

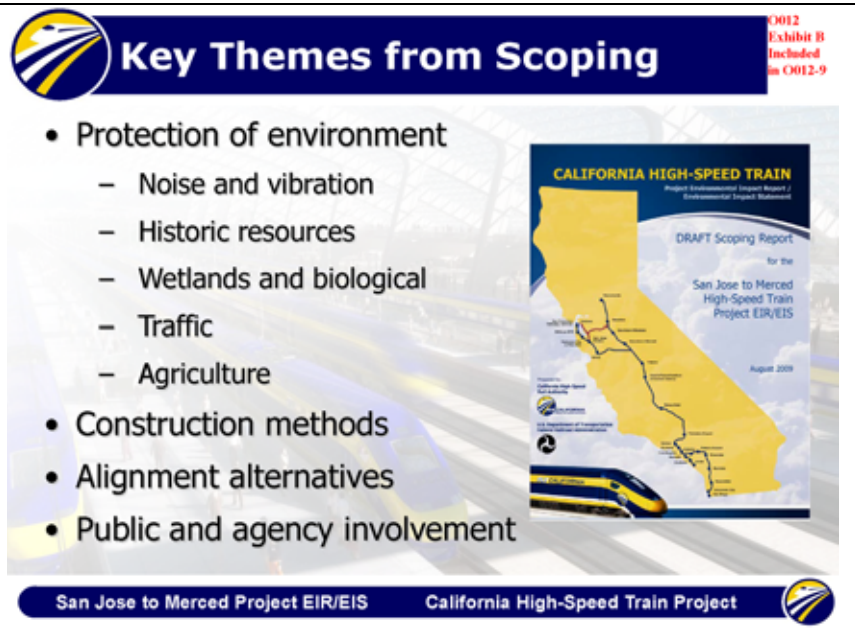

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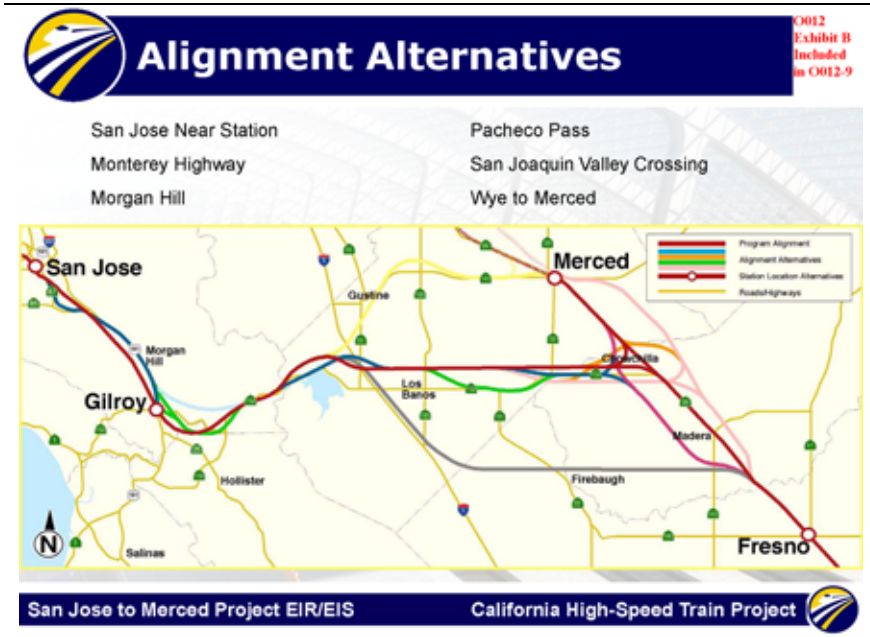

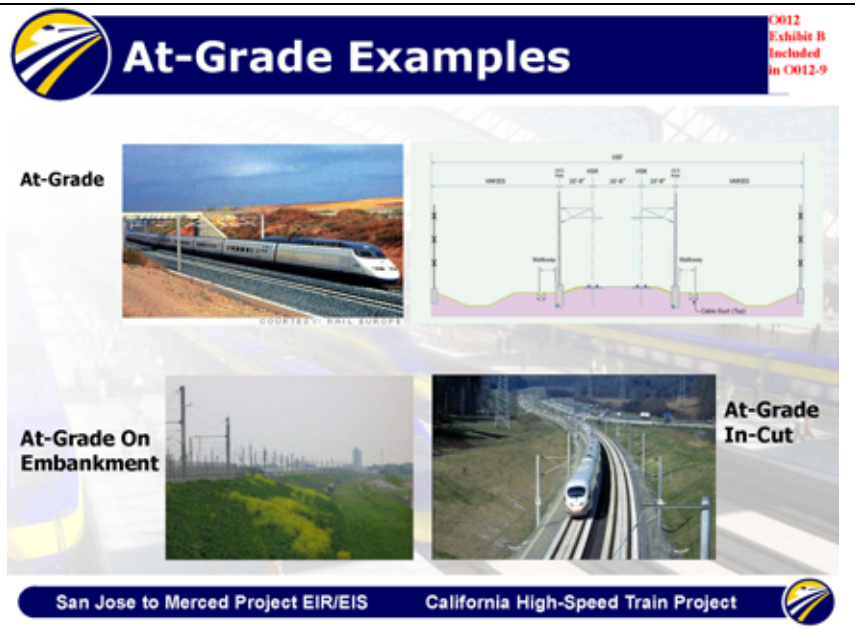

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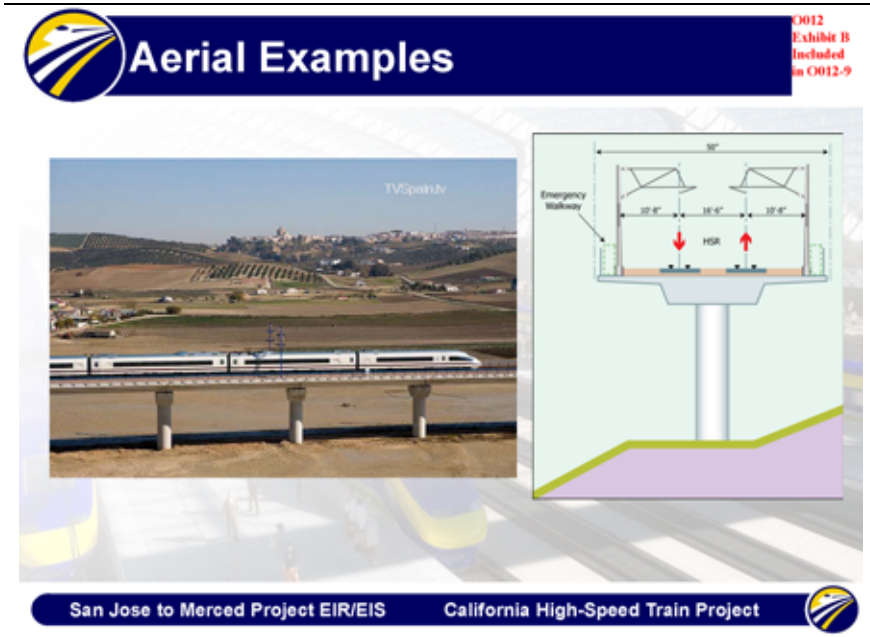

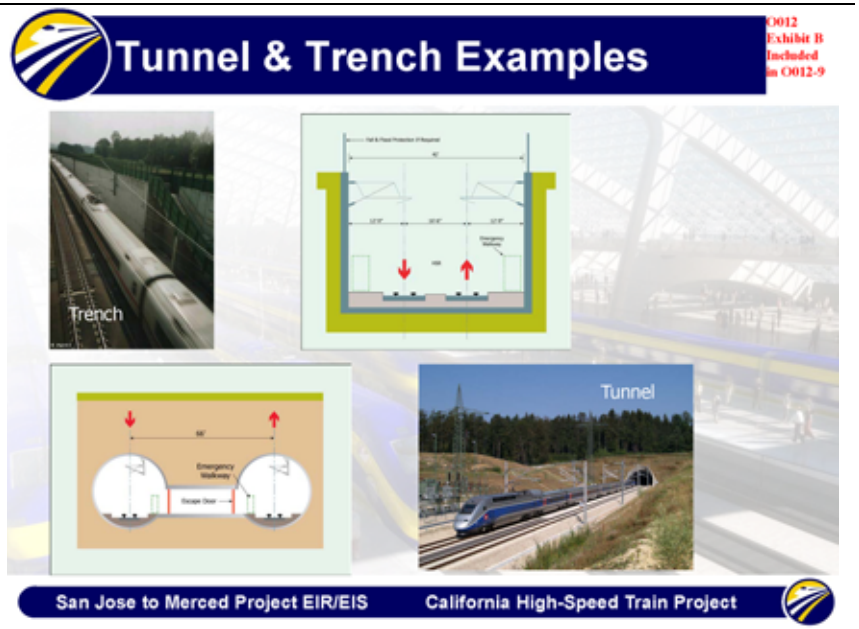

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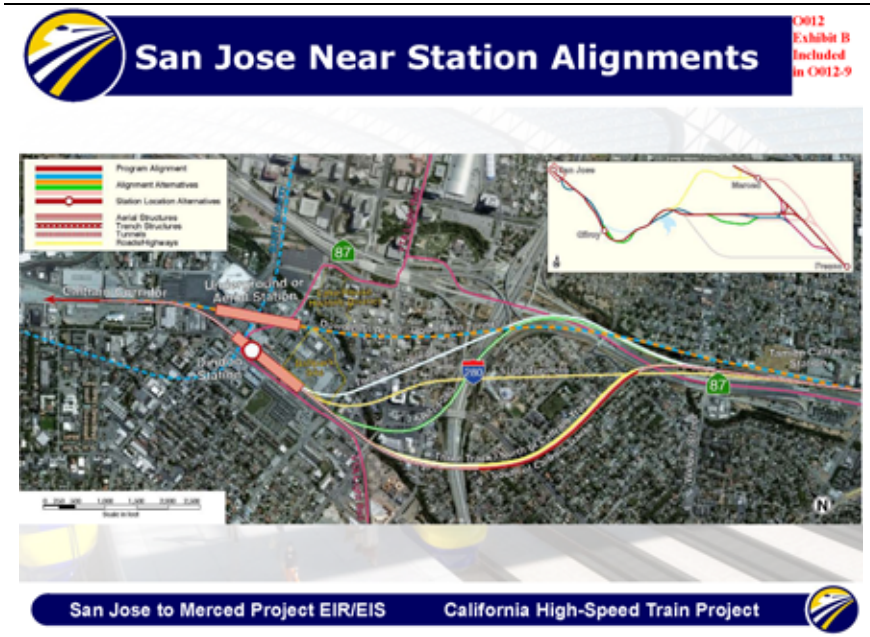

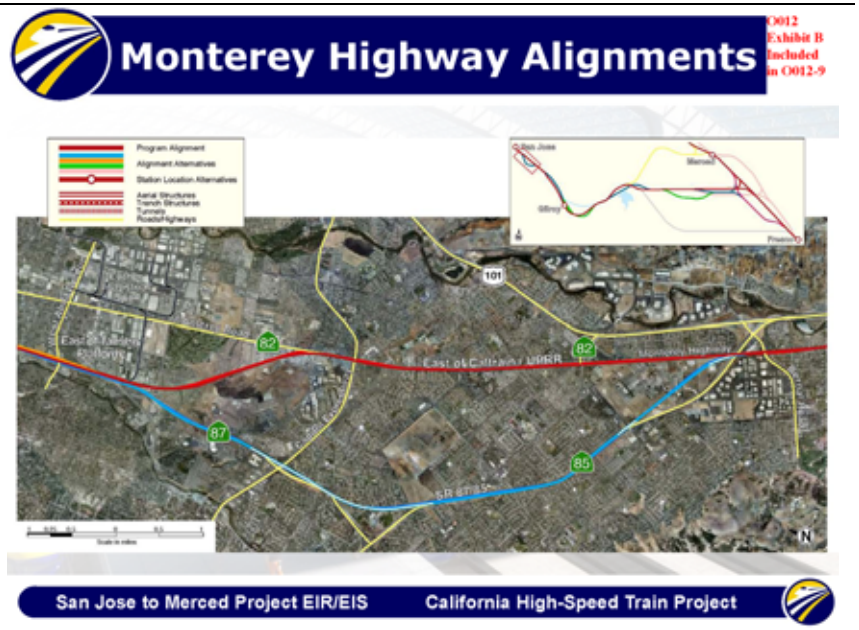

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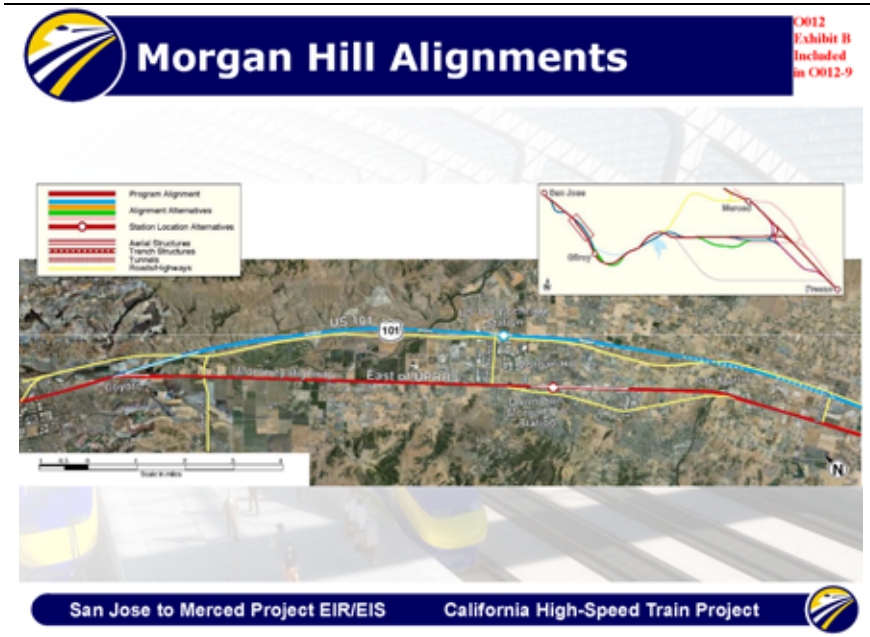

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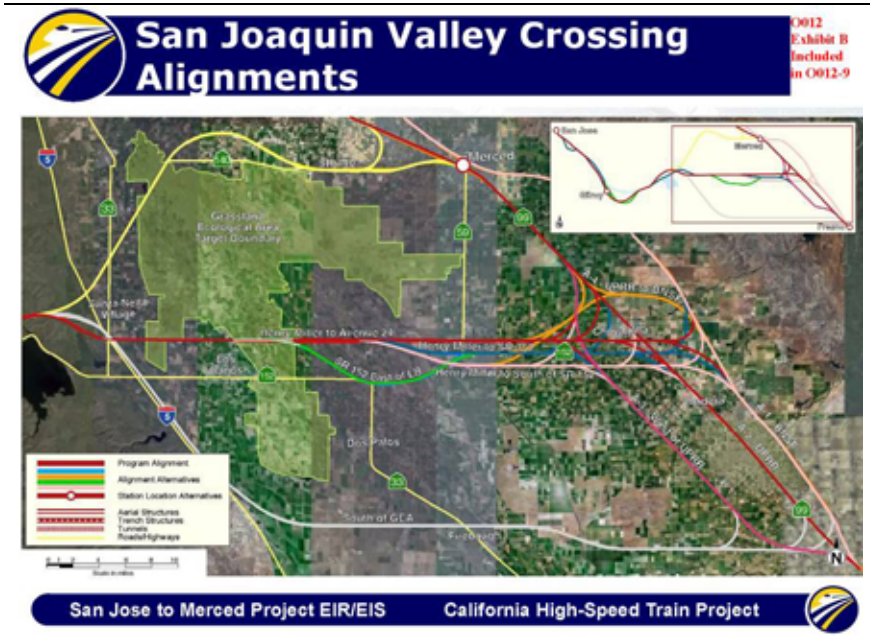

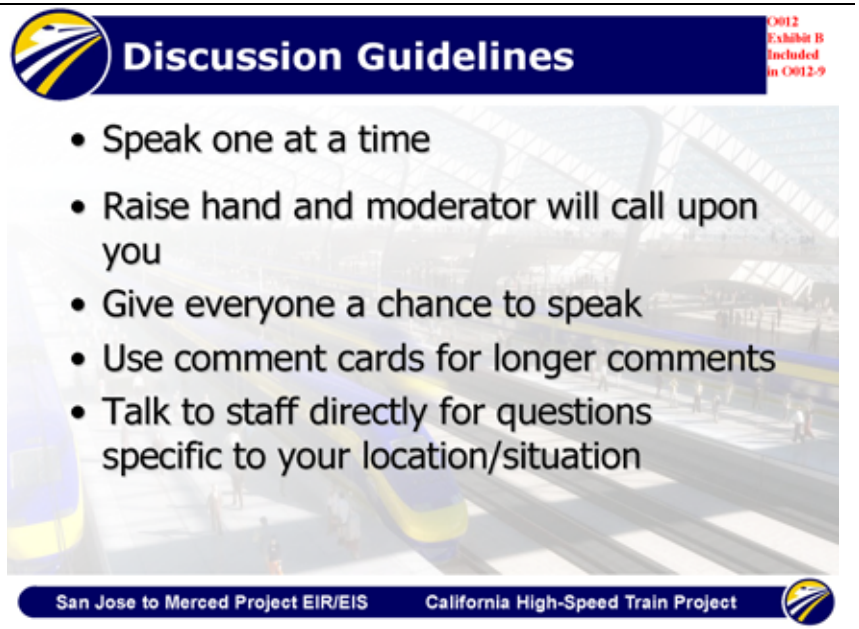

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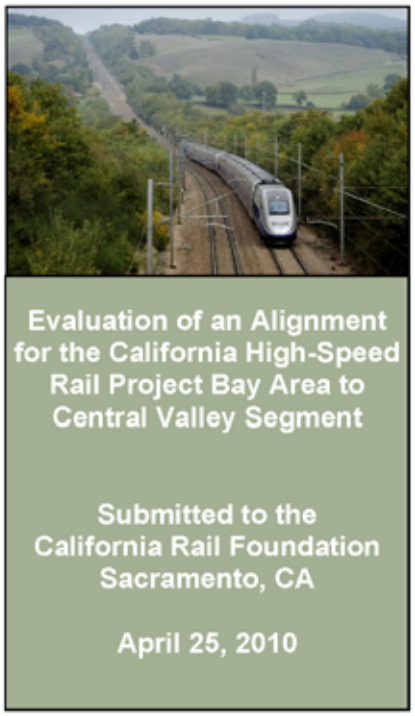
O012 Exhibit C Included in O012-11



Comment Letter O012 - Continued

O012 Exhibit C Included in O012-11

setec ferroviaire

Paris, le 26 avril 2010

N° Affaire – 02226146

pour cette affaire téléphoner au.....: +33 1 40 04 67 61
affaire suivie par .....: Philippe Voignier
fax.....: +33 1 70 73 47 13
mel philippe.voignier@ferro.setec.fr

California Rail Foundation
1730 Thirteenth Street
Sacramento
California 95811
USA

To Richard Tolmach

Subject : California HSR

Dear Richard,

The California Rail Foundation has retained SETEC to provide research on technical issues in connection with public comments on the Bay Area – Central Valley High Speed Rail Final Program Level EIR.

I thank you for having chosen SETEC.

Please find enclosed the proposed SETEC final report (version 4 dated April 25, 2010).

I hope this report will be helpfull.

Yours sincerely,

Signature

Philippe Voignier
General manager

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HSR Infrastructure Expertise

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1. Introduction

A public comment period is proceeding on the Bay Area–Central Valley High Speed Rail Program Level Environmental Impact Report, which considers alternative alignments on the San Francisco to Merced portion of the California High Speed Authority (CHSRA) project.

The following map shows alternative high-speed rail routes in Northern California as they were originally presented by CHSRA.

The California Rail Foundation has retained SETEC to provide research on technical issues in connection with public comments on the Bay Area–Central Valley High Speed Rail Final Program Level EIR. Two main issues are at stake:

- ✓ Altamont Corridor alternative route
- ✓ Viability of train-splitting

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2. Altamont Corridor alternative route

2.1 *Caveats / Preliminary Remarks*

Our professional opinion on a proposed alignment is based on the assumption that California procedures and regulations will permit modern railway design and operation. The figures we have developed are reliable for European economic conditions and are given for comparison. Their absolute values are not to be considered reliable at this stage.

SETEC have sought to develop an alternative high speed route worthy of consideration for program level environmental review, by examining basic feasibility from engineering, operations and environmental points of view. The alignment presented is not to be considered a fully developed plan, but one that appears entirely feasible and that deserves further, more detailed studies.

To determine feasibility, we have examined a range of relevant issues including

1. Constructability
2. Adequate commercial speed
3. Cost-effectiveness
4. Lack of fatal flaws
5. Compatibility with adjoining land uses
6. Positive environmental characteristics compared to other alternatives

On this last matter of environmental impacts, we have done significant comparison of the proposed new alternative with the characteristics of the Pacheco Line previously advocated by the California High Speed Rail Authority.

2.2 *Altamont Route*

The Altamont route includes the following components:

- ✓ Possible use of Highway 101 Corridor from So. San Francisco to Redwood City
- ✓ Dumbarton Rail Bridge and line to junction at Redwood City;
- ✓ San Jose rail connection from Fremont;
- ✓ Fremont route alternatives between Bridge and foothills;
- ✓ Route from Fremont to Altamont Pass area.

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2.3 *Dumbarton Rail Bridge*

The existing Dumbarton railway bridge is a short 0.5 mile structure, but the alignment makes a 4.0 mile crossing primarily on an embankment over bay wetlands bisecting former saltworks. The facility was originally intended to be a double-track passenger line and has sweeping 6000 foot curves approaching the Bay on each side. The steel bridge was built in 1910 but has been unused and unmaintained since 1982. 1400 feet of its western approach collapsed in a fire in 1998. It is a double track bridge with a non-ballasted metal deck, but had only the north track installed. Its swing span has been left in the open position.

Subject to condition diagnosis, the existing bridge would likely require a complete rebuild:

- ✓ deck structures approaching the metal bridge allow for only one track, aimed at the north side of the structure,
- ✓ the structure would have to be reworked to sustain current traffic loads, dynamic and seismic requirements.

Two solutions are possible for a new rail bridge across the San Francisco Bay at Dumbarton:

- ✓ a lift-span or a draw-bridge,
- ✓ a high central pier structure like the adjacent Dumbarton highway bridge (photo below).

The Dumbarton highway bridge carrying Route 84 has a central span of about 104 m (341 ft) which allows a marine channel of 90 m (295 ft) wide and 35 m (115 ft) high. This bridge is situated not far north of the existing rail bridge. Although the rail bridge has a maritime channel of less than 140 ft, and we have received information from the U.S. Coast Guard that there is no significant commercial traffic of any sort through the narrow opening, some have asserted that a replacement bridge would need to provide a clear 295 ft marine channel.

A 295 ft maritime channel access would be too wide for a drawbridge. If this requirement is sustained by authorities, the most reasonable solution may be to build a lift-span bridge or a high-central pier bridge similar to the Route 84 bridge.

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Prospects for workability of the lift span on such a high structure are very unlikely. The lift speed of the span is about 0,5 to 0,7 m/s. The duration of a lifting operation is for example in Europe:

- ✓ 5 minutes for the new motorway bridge over the Seine in Rouen: a 100 m (328 ft) span to be lifted 55 m (180 ft),
- ✓ 10 minutes for the Bastide Bacalan bridge over the Garonne in Bordeaux: a 120 m (393 ft) span to be lifted 55 m (180 ft).

The capital expenditure of construction of a lift-span for a bridge of 800 m (2625 ft) is about 20% more expensive than the cost of high central piers. The operation expenditure of a lift-span bridge is also higher.

For these reasons, the small incremental capital cost of a high central pier structure, similar in form to the nearby bridge of SR-84, appears worthwhile, especially in light of the relatively low cost of upgrading the remainder of the 4.0 mile crossing. From a European perspective, it seems inconceivable that such a simple and short bridge would be considered a financial or technical hurdle. There appear to be no significant design, engineering or seismic issues which would make the cost of this short bridge a prohibitive factor or fatal flaw.

2.4 *Altamont – San Jose Connection*

The focus of this SETEC consultation was to investigate the feasibility of connecting San Francisco to the Central Valley via the Altamont Pass. However, trains coming over the Pass will also need to be able to access San Jose as well. While our study of this issue has been only superficial, we suggest further review of the following options:

1). The HSRA, in conjunction with the San Joaquin County Rail Authority, recently conducted a scoping process for a project to improve the Altamont Commuter Express. Any option being considered there should be studied to complete the Fremont to San Jose leg of an Altamont HSR Alternative.

2). The public already owns an unused rail right-of-way stretching from Fremont to San Jose. With the costs for the proposed San Jose BART extension continuing to grow, perhaps the time has arrived for civic leaders to reconsider this project. The right-of-way could be shared by both High-Speed Rail and regional transit, if the project were redesigned to use HSR-compatible equipment similar to the EMUs Caltrain is planning to use. A three-track structure should be considered, to allow HSR trains to overtake regional trains.

3). If a joint project were considered, a route variant should be explored that would pass through the population center of North San Jose, providing access to the Golden Triangle employment area and the San Jose Airport. This would greatly improve ridership.

4). In the previous FEIR, HSRA rejected as infeasible a Fremont-San Jose route running along Interstate 880, an existing impacted corridor with adequate space for elevated structures within its right-of-way. Given our analysis of the feasibility of the Highway 101 Corridor, this potential HSR route also deserves reconsideration. It appears that it would allow a rapid trip to downtown San Jose downtown, within an existing high-volume transportation corridor.

An Altamont connection to San Jose provides a real advantage for the commercial operation and appears to be a valuable corridor. Indeed, the population of San Joaquin and Sacramento Counties would be able to go to the San Jose region without making a long detour through Modesto, Merced, Los Banos, Gilroy and Morgan Hill.

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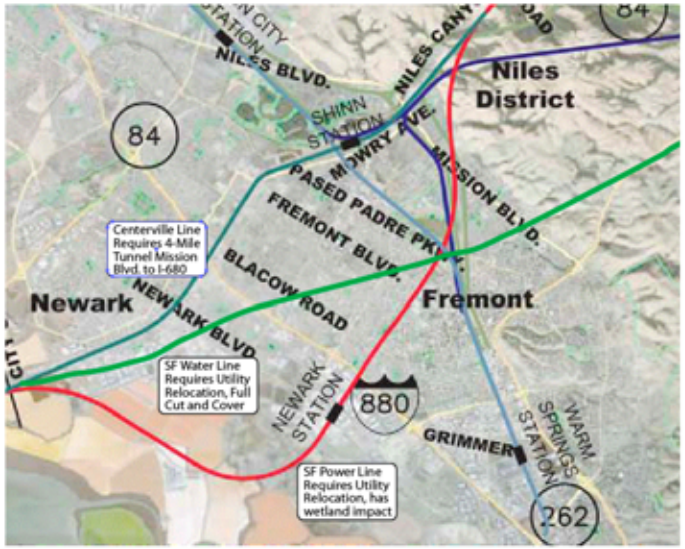
No matter which route is selected to connect Fremont with San Jose, later in this report we have demonstrated the benefits of splitting trains to achieve frequent yet cost-effective HSR service to San Jose.

2.5 *Routes through Fremont*

There are three likely routes through Fremont between the Bay and the foothill crossing:

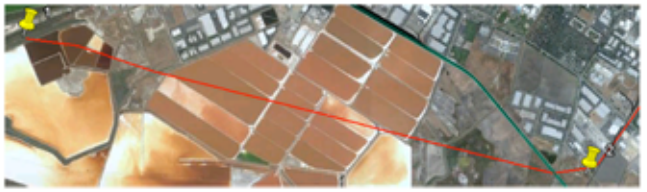
- ✓ Fremont route along San Francisco PUC power lines ;
- ✓ Fremont route via Centerville Line ;
- ✓ Fremont route along the San Francisco PUC water line.



2.5.1 *Fremont route along power lines*

The route along power line is divided into several steps:

1) Between point n°1 and n°2: the route would go along power lines through abandoned salt ponds.



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2) From point n°2 to point n°3 the route would require an over-crossing of an existing railway route.

The alternative high speed route could take this existing route along about 1 mile (until point n°3).

The width of the path is about 74ft.

Traversing the Mulford Union Pacific line involves avoiding a diamond crossing.

An elevated structure through this area would largely avoid agricultural impacts and should virtually entirely avoid habitat fragmentation impacts.

This option also solves the problem of aquatic impacts.

3) From point n°3, the existing rail route goes toward the southeast and the HSR route continues toward northeast direction through light industrial land uses.

Then, from point n°3 to point n°4, the route has to cross highway 880. Because of the configuration of this area, from this point eastward a tunnel would be very advantageous. Further study is required to determine relative costs.

4) From point n°4 to point n°8, the pillars of the high voltage grid take up all the path width. Hence, there is no simple way to a cut and cover section on this alignment without rebuilding the power structures with modern pole infrastructure.

A cut and cover section would have the least negative impacts on the neighborhoods surrounding this line, but it clearly would be a higher cost solution than the water line alternative.

5) At points 5, 6, 7 and 8: four major streets would require special measures to retain traffic flow during construction of a cut and cover section.

6) Then, between points 8 and 9, the HSR route has to cross an extended set of commercial parking lots for about 0,6 miles, best done via cut and cover.

7) At point n°9, an undercrossing of *Fremont Boulevard*, a high volume arterial would be required. From this point eastward to point n°10, an enclosed structure emerging from the ground could be considered because an unbroken 1800 foot path appears available for this transition.

East of point°10, the line traverses the Hayward Fault and can come very close to the planned BART Irvington station, so there are advantages to being above ground for a few hundred yards before finding a path for a beginning of a drilled tunnel into the hills.

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8) Like at point n°9, a level crossing is not possible for the crossing of *Paseo Padre Parkway* (point n°10).

Another elevated structure may be taken into account, with the potential impacts it involves.

Alternatively, in order to avoid impacts on neighborhoods a tunnel could be drilled all the way from points 3 to 11. Indeed, this option avoids the high voltage line if it is infeasible to revise its supports to do a cut-and-cover section. Moreover, a drilled tunnel would significantly decrease the noise and visual impacts.

9) Between 11 and 12, the HSR route has to be:

- ✓ built either on a golf course or a set of houses, parallel to the existing railway track,
- ✓ linked to this existing railway track,
- ✓ built on elevated structure.

The choice of the solution depends on additional study.

Then, for the crossing with the Mission Boulevard (point n°12), the extension of the existing structure has to be foreseen if the HSR route is built next to the existing track.

10) To finish, from point n°13 to the link to the existing track East of Fremont, the HSR route goes, for the first time since the entrance of Newark, through an uninhabited area.

In conclusion, the HSR route along the power line seems to have greater problems than the two next alternatives discussed, because of the current configuration of the affected area.

For this alignment of approximately 9 miles the induced costs could be very significant because of the need for structures to avoid freight tracks and for work to modify power lines to allow passage of the line.

Maximum operation speed should be less than 124 mph according to the Technical Specifications for Interoperability (TSI) of the European railway network.

2.5.2 Fremont route via Centerville Line

This route has a potential connection to the BART network at Shinn, which had been studied as a connection with commuter trains and the Capitol Corridor, but because of potential conflicts with freight uses, it should only be seriously considered if an accommodation can be reached with Union Pacific, to allow conversion of this 5 mile segment to an exclusive passenger line.

At present, the Union Pacific tracks are used by up to about 20 daily passenger trains but only occasional freight. It is perhaps a convenient location for the railroad to store equipment, but generates no significant freight and is not the best connection between any key facilities. From the point of view of operation, freight interaction would be a major negative impact, slowing speeds and reducing slots.

Joint use would also entail unnecessary maintenance problems and should be resisted.

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On the other hand, if the line were to become available for purchase, it might prove an attractive opportunity. In the 1990's Southern Pacific attempted to sell the track to the State of California because it lacked economic importance to the railroad.

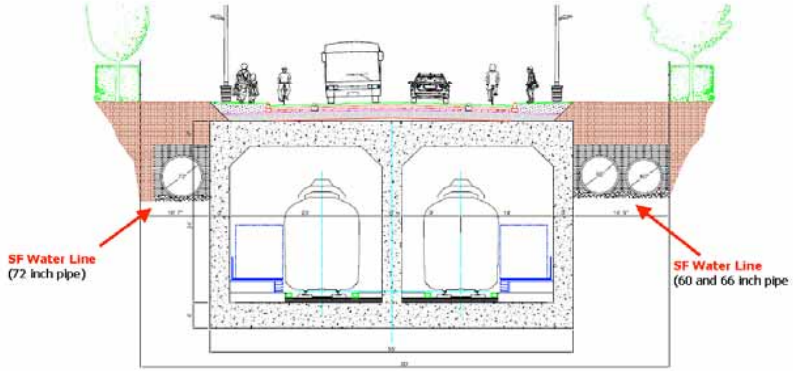
2.5.3 *Fremont route along Pipeline Easement*

This route alternative would use an existing impacted corridor and a space where the only current use is two to three pipelines of the San Francisco Water District. So no homes would be taken for the construction, and there appears to be adequate vertical and horizontal space to allow both trains and water pipes in the right of way, with the water lines fully available for maintenance. Construction could be staged for continuous availability of the water facilities.

One of the main advantages of this route along the water line is that it is relatively straight. Consequently:

- ✓ Maintenance cost for the railway infrastructure would be significantly reduced,
- ✓ Speed may be significantly boosted.

Cross section of Fremont route along SF PUC Water Line according to Section AP-4 (EIR/EIS – Appendix 2E):



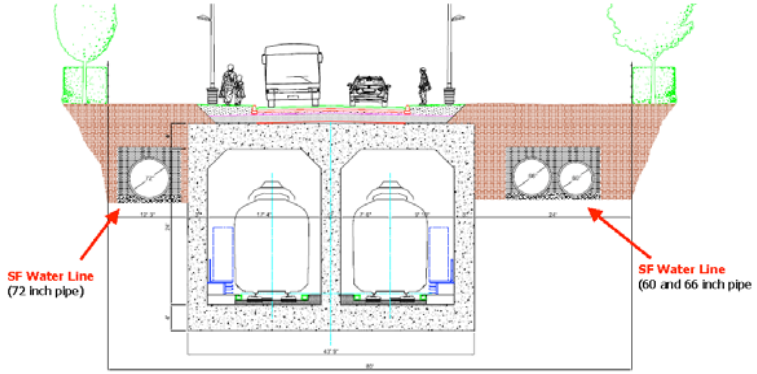
(*See appendix B*)

The SF Water Line right-of-way is owned outright by the San Francisco Water District, which is interested in retaining it, because it is the optimum path toward its newly planned transbay water tunnel. The path is approximately 24 m (80 ft) wide; and two water lines of 60 and 66 inches occupy a section of the right of way. A new 72 inch water line is being constructed to provide redundant capacity.

To make the cross section on the above drawing we used the plans of the Appendix 2E of the Program EIR/EIS. However, according to various similar situations in the railway network in

Europe, the space allowing the passage of trains can be narrowed. So the released space would be a bigger zone for water facilities.

According to French standards, the cross section of Fremont route along SF Water Line could be the following one:



(*See appendix C*)

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2.6 *Synthesis*

Criteria		Altamont route (Inside Fremont) Along power line	Centerville line	SF water line
Operation criteria	Traffic mix	The HSR route is near an existing railway route for approximatively 1 mile in an industrial area (freight transport)	The HST will have to run on the Union Pacific track where freight transports and interurban trains run	It is a new railway alignment so HSR trains are going to be the unique category of transport on this route
	Maximal speed	It is approximately 125 mph if we consider only the circulation of HSR trains. But the speed is limited due to structures, curves and grades.	It is approximately 93 mph if we consider only the circulation of HSR trains.	It is approximately 170 mph.
	Travel time			
	Station	Newark Station	Shinn Station	A station may be built between the bridge and the boundary of Fremont. There is enough space for a station with car slots for the passengers
Environmental criteria	Impacted corridors	The HSR route follow an existing impacted corridor (the power line)	With this route, there is no additional nuisances because the HSR trains will be firstly on the Union Pacific tracks and then in a 4-Mile tunnel.	This corridor already exists. And the additional nuisances due to the HST traffic will be reduced because the HST route will be in cut-and-cover tunnel.
	Visual impact	Little visual impact due to HST being mostly underground		No visual impact because the HST route will be under the ground.
	Noise	Sound impacts for the closest residents.	No	No
	Real estate impact	There is a real estate impact, for example, when the route will run through the countryside (entrance of Fremont) or between Davis Street and Fremont Boulevard.	No, because the HST route will join an existing line	The corridor is already occupied by the SF water line. So HST route and SF Water Line will have to share the same ground coverage.
Investments	Conditions of realization	Major sections of cut-and-cover tunnel are required. Some structures have to be designed.	Negotiations with the railroad would determine if purchase of the route is possible.	A full cut-and-cover tunnel has to be designed.
	Infrastructures and length	The construction of 2 tunnels or several elevated structures is necessary for the crossing of the highway 880, the crossing of Paseo Padre Parkway or between Davis Street and Fremont Boulevard		
	Elevation			
	Tunnel or cut-and-cover tunnel	Approximately a 4 mile cut-and-cover tunnel		Approximately a 5 mile cut-and-cover tunnel

2.7 *Altamont Pass Route*

In order to realize current European standards of operation in developing the design of a new Altamont Pass route (between Fremont and Tracy), we have made the following design assumptions:

- ✓ To provide the fastest Fremont to Tracy travel time, the new line would not deviate to serve the centers of Livermore or Pleasanton.
- ✓ To allow these two centers to be served by planned Bay Area Rapid Transit extensions,
- ✓ To limit the length of tunnels or elevations,
- ✓ To follow existing impacted corridors if possible (highways and power lines) and avoid the new impacts that would be caused by traversing residential areas,
- ✓ To bypass existing Union Pacific rights-of-way to avoid operation conflicts and to avoid being dependent on other services.

Proposed Altamont Pass Alternative Alignment
Green Route: A Higher-Speed, Lower Impact Alternative

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Consequently: the route which is considered by SETEC is a route which will eventually allow a 215 mph speed. However, the preliminary design alignment delivered by SETEC today allows a speed of 185 mph. We are confident that this route could be optimized in subsequent design refinement in order to reach a speed of 215 mph.

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On this preliminary design alignment, there are approximately:

- ✓ 3.56 miles of embankment,
- ✓ 7.75 miles under tunnels and 5.10 miles of cut-and-cover section.

It may be possible in subsequent design refinement to increase the amount of embankment and structures, while decreasing the length of tunnels, particularly in the Patterson Pass area.

Instead of impacting sensitive Sunol Creek species, the proposed route runs via I-680 and a quarry, providing mitigation of existing spoil.

This route parallels a high voltage grid for the majority of the mileage between Fremont and Tracy. Thus, an impacted corridor is used, particularly through the southern Livermore Valley (nevertheless, this corridor will have to be widened); the HSR route will use earth berms or other noise barriers to mitigate any sound impacts to residents closer than 1 mile.

Finally, with this route, the distance between Fremont and Tracy is approximately 31.5 miles, while the HSRA's most recent route linking Fremont Centerville, and Livermore via UPRR rights of way is approximately 40 miles.

See the attached documents (Appendix A).

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		Altamont Routes East of Fremont	
		Dumbarton, Fremont Centerville, Livermore, UPRR	SETEC's proposed alignment
Criteria			
Operation criteria	Traffic mix	HST will have to share an existing route with freight and passenger trains.	It is a new railway alignment so HSR is going to be the unique category of transport on this route.
	Maximum Speed	Maximum speed is approximately 217 mph (between Vasco Rd. and Tracy) but there are many sections where the speed has to be reduced (for instance, around Pleasanton Station : V=80mph).	The route is relatively straight, and allows maximum speed of 217mph on the entire alignment between Fremont and Tracy
	Travel Time		
	Station	3 stations : Pleasanton, Livermore and Vasco Rd. but these are very closely spaced: 7 miles and 3 miles respectively.	No new stations for minimum impact. Or, if necessary, a station may be designed south of Livermore.
Environmental criteria	Impacted Corridors	A new impacted corridor between Vasco Road Station and Tracy.	New railway route, so a new impacted corridor is created, but this route follows existing impacted highway and power line corridors.
	Visual impact		
	Noise		
	Real estate impact	Only between Vasco Rd. and Tracy	Important real estate impacts because HST route does not adjoin an existing railway.
Investments	Conditions of realization		
	Infrastructures and length		
	Elevation	Approximately 3.48 miles of embankment	Approximately 3.56 miles of embankment
	Tunnels	Approximately 6.34 miles of tunnels.	Approximately 7.75 miles of tunnels.

2.8 Dumbarton Bridge – SFO Airport route via Highway 101

Using the Altamont Corridor from Tracy to Redwood City would provide more rapid access to the Bay Area than Pacheco, meaning that conventional-speeds (79 mph) operation would become feasible between Redwood City and San Francisco.

If Altamont is used, construction of a four-track grade separated line would not be required on the Peninsula, but the additional trains would still have some impacts upon neighborhoods north of Redwood City. Because of these impacts, San Mateo County communities are interested in study of feasible alternatives, which have not been specifically examined in regard to Altamont.

Of the two highway corridors (Interstate 280 and Highway 101) preliminarily examined as a alternative to Caltrain between Redwood City and northern San Mateo County, Highway 101 appears to have more promise because it intersects the Dumbarton Bridge Caltrain tracks and also offers the potential of directly serving the San Francisco International Airport before rejoining the Caltrain corridor.

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San Francisco International Airport (SFO) is located 13 miles south of downtown San Francisco in San Mateo County. SFO is the largest Bay Area airport and the tenth largest in the United States. In 2008 the airport served over 36 million annual passengers (boardings and arrivals) and future demand is projected to be more than 60 million passengers by 2035.

Access to SFO is presently a major source of traffic congestion on Bay Area highways and is one of the most significant traffic generators on Highway 101. A railway solution that would provide a direct link to SFO's AirTrain peoplemover system seems to be essential to serve regional transportation needs.

Connecting the San Francisco Transbay Transit Center directly with SFO and a 125 mph line to the East Bay, Stockton, Modesto and Sacramento would greatly increase the value of HST service to Northern California.

Using SFO as the hub has especially significant commercial benefits for HST, because of the possibility of code-share travel combining air and rail segments. The airport hub would also enhance the connectivity and accessibility of through HST connections with other transportation services.

The US-101 alignment between Dumbarton Bridge and the SFO Airport is constrained by existing bridges at 12 locations that would have to be traversed by the 15 mile HST alignment. However this highway-alignment solution appears viable (more workable than Caltrain or the other proposed alternative routes) and represents a more advantageous option for several reasons, and above, all in order to optimize HST operation:

- ✓ A dedicated way solely for the high speed train traffic allows the operation to be totally independent from highway crossings, freight trains, and commuter train traffic.

Indeed, no operational conflict would take place, contrary to the option that recommends sharing infrastructure in the Caltrain corridor.

- ✓ Traffic on an elevated structure prevents all the problems of interference with existing CalTrain infrastructure (no level crossing or diamond crossing).

In the French railway network, when a new HST line is designed and built, sharing infrastructure with other train services is avoided as much as possible. The HST is perfectly compatible with the conventional line, but track maintenance tolerances for HST are much more restricted than usual. Other trains quickly damage track geometry and rail surface. Joint use means frequent maintenance works would increase costs and decrease available slots for commercial operation.

So the option of a route on an elevated structure above US-101 allows an optimized HST operation and allows the requirements of project acceptability (especially travel time) to be achieved.

Furthermore, relatively few constraints are induced by the US-101 alignment. Indeed, only two curves just south of SFO airport would require a small decrease of the HST speed. Then, after this zone, the US-101 route is not a limiting factor to reach 125 mph between SFO airport and Redwood City.

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An advanced study would allow the possible speed and the required infrastructure to be determined exactly in these two curves, approximating 4000 ft radius and 2500 ft radius. But, even if a reduced speed must be imposed on this short section, this option is nevertheless more advantageous than a route with numerous level crossings and restricted speed areas (as in the Caltrain corridor).

Theoretically, with European standards of superelevation and operation, no slowing of a train from 200 kph (125 mph) would be necessary on a 4000 ft radius, and a train with a speed of 177 kph (approximately 110 mph) may take a 2500 ft radius curve. However, current Caltrain standards are lower, and would further restrict speeds on both curves of such radius below 125 mph.

In conclusion, the most important point which has to be taken into account is the advantages in operation and maintenance cost, as described above. It is true that this solution is going to involve significant construction costs and an urban redevelopment of the US-101 zone during the construction. But, after the works and when the HST will be in use, the maintenance of this line will be reduced in cost because the infrastructure will not be damaged by the freight or other passenger trains (which have greater axle loads).

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3. Environmental issues

3.1 Caveats / Preliminary Remarks

First of all, it must be stated that the following considerations are presented according to our impressions, our knowledge and understanding of this project.

Moreover SETEC is very aware of European law and practice, but we do not have the benefit of specific knowledge of USA environmental laws or environmental protection practice.

Data used for this analysis are from:

- ✓ Bay Area to Central Valley Final Program EIR/EIS,
- ✓ Habitat Conservation Plan developed by San Francisco Public Utilities Commission and Alameda Creek Aliance comments,
- ✓ www.fws.gov/desfbay,
- ✓ www.ramsar.org/cda/en/ramsar-activities-wwds-two-new-us-ramsar-sites/main/ramsar/1-63-78%5E22428_4000_0__,
- ✓ www.maps.google.com,
- ✓ www.parks.ca.gov

The impacts of the Altamont alternative performed by SETEC are described from the Caltrain right of way in Redwood City to Highway 99 in Manteca.

Two kinds of impacts may potentially generate issues: impacts upon the natural environment and impacts upon human settlement.

3.2 Natural Environment

3.2.1 Potential impacts identified for the project and recommended measures

Major potential negative impacts of a high speed line on the environment (wetlands, parks, forest, etc.) are:

- ✓ destruction of habitats
- ✓ severing of ecological connections

From the west to the east, the observed probable impacts of the Altamont alternative proposed by SETEC are the following.

To begin with, the project has to cross San Francisco Bay in an environmentally sensitive manner. The old Dumbarton rail bridge still exists, but is not currently in use. The Altamont alternative will use the same alignment to reduce impacts on the Bay, unless it can be shown that adjusting the alignment could reduce biological impacts even more. The potentially significant impacts during construction must be handled in a very sensitive way. If it is possible to work entirely from the bridge structure, that would eliminate the need for access roads and the disturbance of sensitive lands. Construction work would be scheduled to avoid breeding and nesting periods.

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Cap and beam structures (example photo below) are the predominant bridge crossing type used for San Francisco Bay crossings south of San Francisco.

About 2.5 miles of wetlands in San Francisco Bay, are traversed by existing tracks. Replacing existing rail embankments with cap and beam structures such as the one above would be a significant improvement for the wetland environment.

This new proposed Altamont alternative entirely avoids Niles Canyon and sensitive Sunol Creek areas. The line would cross Sunol Valley between Interstate 680 and quarries south of the Sunol valley golf course. This route follows a corridor that is already heavily impacted by highway noise. Habitats of endangered species according to Alliance Creek area are not located in this area but an existing ecological corridor (red-legged frog and tiger salamander) has to be maintained, which could be handled by a plan to use a viaduct structure, to entirely avoid wet areas in the creekbed.

Only one Park is crossed by the project: Sycamore Grove Park in Livermore. Several solutions will be established to mitigate the impact on this park:

- ✓ paralleling the power lines that go through the park,
- ✓ crossing the park on an elevated structure in order not to sever paths (for riders, hikers and animals): A 0.8 mile viaduct would have only about 0.3 miles crossing the park.

It is important to note that the new proposed Altamont alternative also avoids the other potential environmental issues of the Sunol Regional Wilderness, Alameda Creek, Lake Del Valle State Recreation Area and San Antonio Reservoir.

Moreover, the Altamont alternative parallels road corridors (I-680, SR84,) high-voltage power alignments or existing tracks (approaching Tracy) in order to avoid new fragmentation and to avoid sensitive lands.

3.2.2 Additional measures

Ecological connection

In order to preserve the ecological connection and the hydrologic connection, specific structures would have to be provided. Moreover, the extent of tunnels between Fremont and Tracy and wildlife passages could reduce potential negative impacts upon wildlife corridors. Different types of pathways could be used: culverts, box culverts or more significant engineering such as cap and beam structures or viaducts.

For example, in France, in addition to restoration of primary ecological corridors, it is usual to provide smaller structures to have one wildlife path every 0.2 miles. These kinds of measures improve the ecological transparency of the track.

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Examples of wildlife paths under railway:

Conservancy lands and offsetting

Loss of habitats has to be offset by residential developments and conservancy lands.

French practice on this issue is to offset impacted acreage with an equivalent mitigation. The purpose is to find the same habitat to protect or a damaged one to restore. These areas are bought by the client and are given back to local organizations for management.

It could also be to improve kinds of habitats not impacted by the route but which is considered by scientists or environmental activists to be threatened.

Ratio used changes depending on quality or value of the impacted habitat and lands availability.

3.3 Human Environment

3.3.1 Urban area

3.3.1.1 Issues

Several cities are located along the study corridor, including Fremont, Pleasanton, Livermore and Tracy. Many environmental effects are possible issues, but the primary one is noise pollution. Many residences and other activity centers affected by noise pollution (schools, hospitals) are present.

The aesthetic issue is also a potential concern, with the necessity not to create a major disturbance in the landscape.

3.3.1.2 Impacts and measures

The creation of new high-speed rail infrastructure can be a significant source of noise pollution unless projected impacts are carefully mitigated. Although this new proposal is designed to avoid intermediate urbanized areas, there are zones, such as the segment from the Dumbarton Bridge to the foothills east of Fremont where it is necessary to cross about 5 miles of residential neighborhoods.

One measure to mitigate this impact would be to follow the easement of the San Francisco PUC water line traversing the city of Fremont, from South West to North East.

Under this alternative, tracks would be located in a cut-and-cover tunnel. This structure will be approximately five miles long. Thus, there won't be any noise pollution nor visual impacts. Moreover, with this option, there won't be any circulation interruption other than what is necessary for work construction.

However, with this alternative careful planning will be needed to ensure that neighborhoods at the potential East entrance of the cut and cover tunnel are properly isolated from a potential BART-HST transfer station at that site.

Alternative routes through Fremont involve either lower speed service on a converted Centerville Line or a drilled tunnel under the PUC power line easement or another path. These have primarily benign environmental effects but involve higher cost and lower speed. There is a potential that use of the power line easement would entail additional wetland mitigation problems.

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A drilled tunnel from the city of Fremont to the south side of Interstate 680 would extend through the foothills: about 2.2 miles if the PUC water line or PUC electric line is used, about 4 miles if the Centerville Line alternative is used.

Most of other urban areas close to the project are entirely avoided. However some districts south of Livermore could be impacted by the proposed alignment:

- ✓ Housing development southwest of Livermore: Ruby Hill, located at about 0.3 miles from the project track. It is important to note that SR-84 is close to this urbanized area and already causes noise and visual impacts,
- ✓ a wastewater treatment plant is located on the track project, after the Ruby Hill development,
- ✓ Individual houses south and southeast of Livermore could be impacted on a segment of about 0.4 miles.

A part of the hills located between Livermore and Tracy are crossed via a cuts or fills.

Tracy would be skirted on its southern extremity, south of the Union Pacific freight right of way.

Many scattered houses or farms are identified along the project corridor particularly in the Central Valley after Tracy.

Other scattered houses or facilities would be encountered:

- ✓ Between Fremont and Pleasanton: quarry and its facilities,
- ✓ Isolated houses south of Ruby Hill (about half a mile),
- ✓ Several isolated houses would have to be taken by eminent domain.

To mitigate noise pollution, berms or other noise barriers could be used.

3.3.2 Cultivated area

3.3.2.1 Issues

Many cultivated areas surround Livermore city. It is principally high valued cultures as vineyard or orchards.

An ambitious program (Tri Valley Conservancy) has been established to preserve agriculture acreage. As well, the project would have to respect the local legislation about agricultural easement.

3.3.2.2 Impacts and measures

South of Livermore, portions of agricultural holdings are impacted by the track. Most of these are vineyards, which are highly valued agricultural uses, and not easily relocated. However, new high-speed lines have been successfully constructed in areas such as Burgundy and other European wine regions running through highly prized vineyards.

A bit more than 17 linear miles of proposed line are adjacent to croplands:

- ✓ 0.4 miles near the Ruby Hill development (primarily vineyards),
- ✓ 4.1 miles south and southeast of Livermore (primarily vineyards),
- ✓ 14.3 miles between Tracy and the connection with the proposed Sacramento – Merced high-speed rail line (primarily row crops and orchards).

A project to conserve agricultural uses has not been formally defined to date; however, it is clear that some compensation measure could be taken, such as establishing as much new cropland as has been taken for high-speed rail (an acre for an acre or more).

Agriculture easements in Livermore could be compared to "Appellation d'Origine Contrôlée-AOC (high valued lands and products with guarantee of origin like vineyards). The French practice is to reduce acreage impacted in these areas with reduction of embankments. However, it is not usual to provide civil engineering structures like viaducts. For this kind of lands, it could be required to offset impacted lands. It is necessary to find equivalent lands (soil, weather conditions) that guarantee the same origin for the product.

For lands under agricultural easements, a similar approach could be used. For each acre impacted, the Client could try to find an acre of equivalent land. Moreover, it is important to provide connection between fields which are cultivated by farmers. For example in France, it is usual to provide one path every 0.7 miles in agricultural areas.

3.4 Comparison of Altamont and Pacheco Environmental Impacts

The segment between San Francisco and Redwood City is not considered because impacts are approximately the same.

3.4.1 Potential of biodiversity

Lacking geographic documentation that precisely locates habitats or endangered species, this comparison couldn't be about ecological habitat issues but only about potential of biodiversity via a land use analysis.

Firstly, the length of new Pacheco Pass route is two times longer between Redwood City and the future High Speed Rail between Sacramento and Los Angeles. While Pacheco Pass route needs to create more than 60 miles of new route, not following existing corridors, Altamont needs less than 40 miles.

Within protected wilderness zones, areas affected by the Pacheco route are more wooded than those which are concerned by Altamont Area (oak, sycamore, pine). A much more developed biodiversity can be expected from these areas with various habitats.

Although the Altamont alternative route also impacts wetlands (majority on San Francisco Bay) Pacheco Pass route is much more harmful for this high sensitive habitat. The routes go through the Grassland wetlands, internationally protected by the RAMSAR convention. More than 5 miles of this protected area are crossed. In spite of the fact that more than half of this distance is crossed by elevated structure, the route strongly impacts the sustainability of this habitat mostly for the surrounding of protected area. No RAMSAR wetlands are impacted by the Altamont Alternative.

In addition, to join the future HST line between Sacramento and Los Angeles, the Altamont Alternative route goes by an already urbanized way. Many cities are located along the route: Fremont, Dublin, Pleasanton, Livermore, Tracy. Thus, this route will not create a new urbanization spreading across hills, parks and valleys, whereas the Pacheco route crosses a wild area with only occasional human activity presence in a 30-mile segment (from San Felipe to Santa Nella). This fact could induce a new development of urbanization in this area that would be harmful for local biodiversity.

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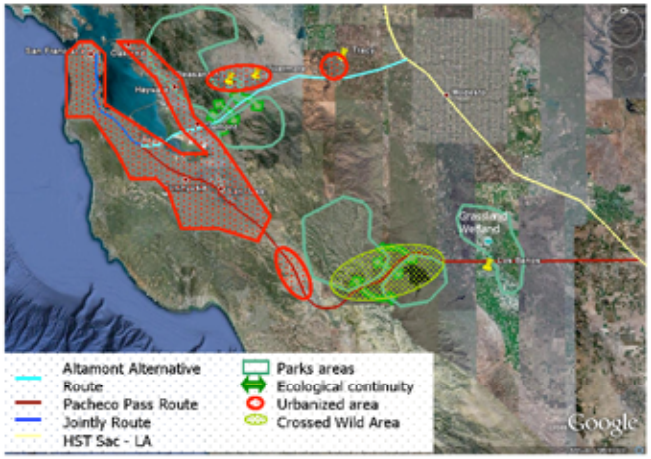
3.4.2 *Ecological connections*

This comparison is also about ecological connection issues that could be approached with the location of main parks and a land use analysis.



The Pacheco Pass route traverses a significant extent of undeveloped lands, located between two large parks:

- ✓ Henry W Coe State Park,
- ✓ Pacheco State Park.

Although these two parks are not completely contiguous and are separated by an unprotected area, an ecological continuity does exist between these two wilderness areas.

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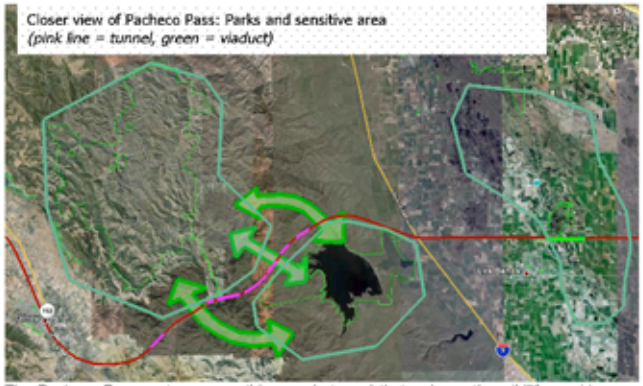
Closer view of Pacheco Pass: Parks and sensitive area
(pink line = tunnel, green = viaduct)



The Pacheco Pass route crosses this area in tunnel that reduces the wildlife corridor-severing impacts between the parks. However, part of tracks in wilderness area and close to the area of parks should be considered as an ecological connection. In these parts, Pacheco Pass alternative would extend without any structure and should cut the ecological connections.

The Altamont Alternative also passes near areas of parks. South of the Altamont route, is located the park of Sunol Regional Wilderness. On the North of the Altamont route, the parks are much more scattered, and really smaller. Most identified parks are recreation areas, likely with smaller biologically importance than the southern large parks.

The Altamont Alternative also proposes to have segments of tunnel or viaduct or to cross sensitive identified areas.

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Zoom Altamont Alternative: Parks and sensitive area
(pink line = tunnel or cut and cover, green = viaduct)

First the Altamont Alternative route crosses between these two areas on a location that is already damaged by a quarry and by an eight-lane highway (I-680). West of the quarry, the Altamont alternative would run in tunnel and then come between I-680 and the quarry. That place should be a less sensitive ecological area. Specific structures should be provided to restore a potential wildlife connection.

Then Altamont alternative would extend through the Sycamore Grove Park on a viaduct that considerably reduces the potential of severing any wildlife corridor.

3.4.3 Agricultural issues

From Gilroy to Chowchilla, the Pacheco Pass route crosses more than 50 miles of agricultural lands. A part of the route (less than a third) uses an existing corridor: Henry Miller Road, but the land division impact caused by a two-lane road is not as significant as a new one caused by a rail infrastructure.

To compare, Altamont Alternative crosses about 18 miles of agricultural lands, on elevated structures for a part of these lands. The design proposed for Altamont takes into account the necessity of connections for farmers and the reduction of impacted acreage. This preliminary design could be refined to mitigate agricultural impacts.

3.4.4 Urban issues

The Pacheco Pass route crosses more than four times the linear mileage of residential areas as the new Altamont Alternative. The Pacheco route runs from Redwood City to Gilroy, impacting residential communities for about 45 miles, versus about 10 for Altamont including about 5 miles through Fremont and 5 miles adjacent to Highway 880 on access to San Jose). Whereas Altamont Alternative considers approaching cities without going through them or by using cut and cover structures (in Fremont), the Pacheco Pass route proposes to repeatedly cross residential neighborhoods at grade or by elevated structures. As well, the new Altamont Alternative is far less damaging from the standpoint of noise pollution and visual impacts, because of the lack of contact with residential neighborhoods.

3.4.5 Conclusion

As a conclusion, the Altamont Alternative may be considered by far the less impacting alternative for biological diversity, agricultural and urban issues.

4. Outcome

The Altamont route will provide an improved rail corridor between the northern San Joaquin Valley and the Bay Area to support passenger service between the Bay Area, the Tri Valley area, and the Northern San Joaquin Valley.

In addition, this route will offer a travel alternative that is competitive with the travel costs and time of auto, intercity bus and regional air modes.

It offers a route that avoids or minimizes impacts to the environment by sharing joint use infrastructure, depending on the chosen route (between the different proposed alternative alignments).

Potential stations should include Stockton, Tracy, Livermore, Fremont (vicinity), Milpitas and San Jose.

This project will provide several connections to numerous San Joaquin Valley and Tri-Valley cities (Stockton, Merced, Turlock, Modesto, Manteca, Tracy, Livermore, Pleasanton, Dublin, San Ramon and Fremont) where over one million people live.

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5. Viability of Train-splitting

5.1 *Definition and Economic Benefits of Train-Splitting*

A typical European high-speed train is made up of two independently operable segments, each with control cabs at each end. Coupled together for most of the journey, they can be driven by a single operator. A second operator added at a junction allows the coupled sets to divide to serve different origins or destinations. This process, called train-splitting, allows service to multiple locations to be more economical than using full-length trains, because ridership per vehicle is increased, while fleet power and maintenance costs are reduced. Driving labor becomes much more productive by freeing the second driver to run repeated trips on the branch line.

The following text gives examples of where train-splitting is frequently done on European high speed trains under circumstances similar to the S.F. Bay Area proposed service, as well as explaining conditions in which its economics are especially favorable.

5.2 *European Examples*

There are many places on the French TGV network where this type of operation is very frequent, especially diverging lines which can share most of their mileage.

Domestic traffic in France

On the TGV–South East network coupled-set trains from Paris arrive in the following junctions:

- ✓ Dijon, splitting for trains:
  - to Besançon and Switzerland;
  - Southward on the old PLM line up to Chalon.
- ✓ Lyon Saint Exupéry TGV splitting for trains:
  - to Grenoble ;
  - to Avignon ;
- ✓ Lyon Part Dieu (central station), splitting for trains:
  - to Marseille ;
  - to Montpellier.
- ✓ Lyon, Part Dieu (central station), splitting for trains:
  - to Saint- Etienne
  - running to Lyon Perrache terminal station
- ✓ Marseille Saint Charles (central station), splitting for trains:
  - to Côte d'Azur up to Nice ;
  - ending in Marseille terminal.

On the TGV–Atlantique network, coupled set trains from Paris split in:

- ✓ Rennes : fifteen coupling and splitting operations are daily carried out in Rennes station
  - to Quimper;
  - to Brest.

On the TGV–Inter-secteur network, coupled set trains from Marseilles split in:

- ✓ Le Mans: splitting for trains:
  - to Rennes;
  - to Nantes.

International traffic

On the Thalys network, coupled set trains from Paris arrive in:

- ✓ Brussels, splitting for trains:
  - to Amsterdam;
  - to Köln.

On the German ICE Network, coupled set trains from Frankfurt arrive in:

- ✓ Cologne, splitting for trains:
  - to Bruxelles;
  - to Amsterdam;
  - to Dortmund.

On the German ICE Network, trains from Berlin arrive in:

- ✓ Hamm, splitting for trains:
  - to Cologne;
  - to Düsseldorf and Cologne Airport.

The reverse operation is similar when SU (single unit) trains coming from different destinations are coupled into MU (multiple units).

In the French railway network, splitting and coupling operations on high-speed rail are common. These basic operations generate no hazard in trains' operation.

5.3 *Train-splitting at the Conceptual Level*

The economics of train-splitting make it advantageous for the carrier to couple two trains together on a route in the following cases:

1st case: when two trains towards different final destinations have a common route on a long distance,

2nd case: when two trains from different origins end at a common final route, with a significant length.

The third case takes place when the traffic on the a portion of a route does not merit the capacity of a two-unit train.

Coupling trainsets together in all of the above cases allows more frequent service than would otherwise be economically justified. These same advantages of train-splitting appear to pertain to California as well as Europe because of the relatively long common routes on the CHSRA network.

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These 3 cases are illustrated below:

Figure 1: Case 1

Figure 2: Case 2

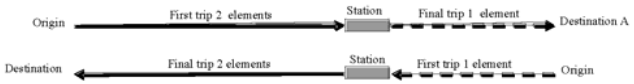

Figure 3: Case 3

Note: The configuration of convoys depends on the commercial demand.

5.4 The sequence of coupling and splitting operations

Train-splitting and train-coupling take place in the following way:

Figure 4: Train coupling

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At H+ 0 minutes, the 1st train from A arrives at the station. As soon as the train stops, access to and egress from the train are permitted.

At H+5 minutes, the 2nd train from B arrives slowly because the platform is already partially occupied by the first parked train. Signaling for access to this platform must be adapted for this operation.

At H+10 minutes, after tests (of functioning, motorization, braking, etc.) have been completed, the two-segment train can leave the platform with just one operator driving it.

The figure below summarizes diagrammatically the operation:

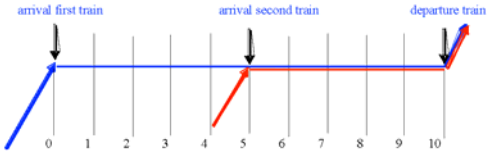

Figure 5: Graphic figure of a coupling operation

For the passengers of the first train, this operation increases travel time by 5 minutes. Trip times for passengers of the second train are unaffected.

The delay for one of the two trains requires the other one to wait. The limit of a reasonable waiting time must be evaluated on a commercial level. Beyond this maximum, the first unit should leave without waiting for the second unit. Special scheduling of extra board drivers is necessary for the departure of two separate trains.

The coupling system is well designed. It is a well-used and perfectly mastered technique. And the coupling operation does not generate delays in train traffic.

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The following example illustrates the splitting operation for a train:

Figure 6: Train-splitting

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At H+0 minutes the two-unit train arrives at its junction. As soon as the train stops, access to and egress from the train are permitted.

At H+3 minutes (minimum duration of the travelers' service) the first train set can leave its platform,

At H+6 minutes (spacing time between 2 trains; according to the facilities and to the route signaling, this time can be reduced): departure of the second train.

The figure below summarizes diagrammatically the operation:

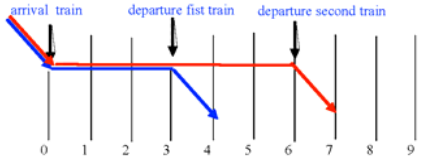

Figure 7: Graphic figure of the operations

At least one operator has to be at the station at the arrival of the coupled units to drive the second train. Hence scheduling of the drivers' has to be arranged in the aforementioned way.

As with the coupling operation, the splitting operation of two trains does not present any significant problems.

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For both of these two operations, to completely take advantage of a single operator driving, and the use of a single path, the station where these operations take place has to be located as close as possible to the divergence/convergence point of the different destinations.

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In case 3, there is a splitting and coupling operation; however, the difference from the previous cases comes from the fact that in the splitting case a segment (the second one) stays in the station after the departure of the first segment. In the coupling operation, the first segment is placed on the track, waiting for the second segment.

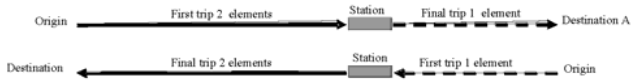

Figure 8: splitting/coupling of one segment or "element."

5.5 *The Pacheco and Altamont Routes*

Two alternate routes have been studied connecting the San Francisco Bay Area and the Central Valley. On the schematic figure below:

- ✓ The Pacheco Route is in red
- ✓ The Altamont Route is in green

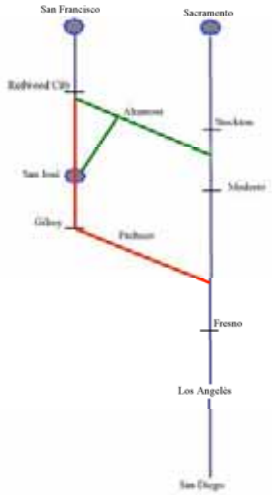

Figure 9: schematic plans of the routes

This report will make a comparison between the two routes according to the following criteria:

- ✓ Operational criteria
- ✓ Commercial criteria

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Operational Criteria

High speed trains are foreseen for the journeys: Anaheim ⇔ San Francisco Bay Area and Sacramento ⇔ San Francisco Bay Area.

All High-Speed Trains:

The current preferred plan of the High-speed Rail Authority is for HSR trains to use existing Caltrain rights-of-way for access to San Francisco. On this network, hundreds of high-speed trains would have to share infrastructure with Caltrain commuter trains. These commuter trains have frequent station stops, so their average speed is relatively slow. The faster long-distance trains must match the speed of the slow trains; hence their paths are impeded unless the High-Speed Rail Authority builds additional tracks between Gilroy and San Francisco, adding significant costs and environmental consequences.

With the Pacheco plan, the route on or adjacent to the commuter rail network between Gilroy and San Francisco is about 79 miles.

With the Altamont plan, which would join the conventional line at Redwood City, the common route from and to San Francisco will be about 26 miles (a savings of 53 miles).

These 53 miles of track are freed up for circulation of Caltrain. Thus this configuration allows for market development of commuter trains and significantly reduces the number of conflicts between slow and fast trains. It also represents a decrease of 53 miles of traffic in a railroad environment not well suited to HST.

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Bay Area/Sacramento ⇔ Anaheim/Los Angeles

It is not compulsory that every train is composed of 2 segments, one to the Bay Area and the second one to Sacramento. But for the trains established in that way, operation of a single MU train on the larger part of the route seems to be judicious.

With the Pacheco plan, splitting and joining operations would have to take place in Fresno, the first common station to both Bay Area and Sacramento branches.

With the Altamont plan, these operations could take place at Modesto or Tracy station depending upon system configuration.
There are 94 miles from Fresno to Modesto, and over 120 miles from Fresno to Tracy.

Thus, there is a saving of at least 94 miles per operator, per schedule, per day and per direction, a significant sum on a continuing basis.

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San Francisco ⇔ Sacramento

The distance between San Francisco and Sacramento:

- ✓ With the Pacheco plan, because of recent changes near Merced is about 300 miles.
- ✓ With the Altamont plan, approximately 150 miles (+/- 3 %)

The saving of travel mileage per train run is about 150 miles (50 %).

This important distance-saving reduces travel time between the two cities in the same proportions. This time saving reduces by about half the necessary fleet to operate this service. **The route through Altamont offers a distance saving of approximately 150 miles with valuable cost savings on rolling stock.**

⁂

San Jose ⇔ Sacramento

The distance between San Jose and Sacramento:

- ✓ With the Pacheco plan, because of recent changes near Merced is about 250 miles.
- ✓ With the Altamont plan, approximately 130 miles (+/- 3 %)

The saving of travel mileage per train run is about 120 miles (45 %).

Splitting Altamont trains in either Fremont or Redwood City would allow shorter service to Silicon Valley and San Jose, as compared to the longer Pacheco route through Chowchilla and Merced.

The route through Altamont offers a distance saving of approximately 120 miles with valuable capital and operating cost savings on rolling stock.

⁂

Dedicated San Jose ⇔ Anaheim/Los Angeles trains

Altamont also provides the potential of dedicated San Jose – Anaheim/Los Angeles trains via a join or split in either Redwood City, Fremont, or Tracy. Using Pacheco, southbound passengers from San Jose may find it difficult to obtain prime seating, because trains may already be filled with San Francisco passengers. With the Altamont alternative, San Jose passengers would have first choice of seating and more direct service than current Pacheco plans would offer.

The route through Altamont offers superior management of available seating for San Jose passengers.

⁂

Conclusion: all the criteria described above favor of the route through Altamont.

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Commercial Criteria

The travel time is compared for both plans.

San Francisco Bay Area ⇔ Anaheim/Los Angeles

With the current Pacheco plan, the distance from San Francisco-Fresno about 194 miles. With the new Altamont plan, this distance is estimated to be essentially identical (+/- 3 %). Even if Altamont route is a little bit longer (as much as 5 miles), the route through Altamont is nevertheless more favorable, with a quicker travel time from/to Southern California, because of the avoidance of 53 miles of shared track with Caltrain local trains.

The route through Altamont allows a time savings on the travel between Anaheim/Los Angeles and the Bay Area.

⁂

San Francisco ⇔ Sacramento and San Jose ⇔ Sacramento

The circuitous nearly 300-mile Pacheco route produced by newly imposed line detours near Merced has increased the travel time of service between San Francisco and Sacramento to approximately 1 hour 55 minutes. Even with a projected average speed of 158mph, the service would provide slower travel than Highway 80..

The Altamont plan allows a nearly 50 % time savings. Hence, the travel time is approximately 1 hour, about 30 percent faster than driving.

The route through Altamont allows a time savings on the travel between Sacramento and the Bay Area.

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Figure 10: Figure Comparing Regional Travel via Altamont and Pacheco

The new Altamont route is capable of producing much more Bay Area – Sacramento traffic than the Pacheco route especially if trains are split in Fremont or Redwood City to allow direct connections to Silicon Valley and San Jose as well as SFO International and San Francisco.

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Traffic potential of the network

The figure 11 below shows the flows of circulation (road, airplane and railway) between areas.

The Altamont plan, from the operator's point of view, has important and undeniable benefits to its advantage:

- ✓ Reduction of the shared route along the commuter railway line,
- ✓ Saving of travel time,
- ✓ Saving of rolling stock,
- ✓ Saving of number of drivers,
- ✓ The key San Francisco – Sacramento travel market shows a very large available traffic flow (140,000 journeys / day) which will contribute to the economic success of the project.

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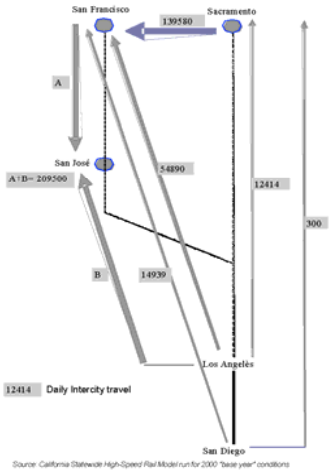

Figure 11: Daily moves

5.6 *Positive and negative impacts*

As mentioned above, to save time it is important that the coupling (or splitting) operation is as quick as possible. An automatic coupling system between trains must be very efficient and reliable which means that it is protected by a cover during travel to avoid pollution or obstacles which may compromise the good process of the operation.

Another requirement is to have a trained assistant waiting at the splitting station to assist the driver during merging and coupling. He or she is not required to be a driver, just an operations assistant, able to open the cab and providing the required information/instructions to the driver.

Another way to facilitate the operation is to have 2 drivers, one for the front train who stays and drives the coupled train after, and a second driver who helps during the coupling but stays inside the station afterwards for another departure. Their time schedule is adapted to the service they must perform.

It should be noted that the time of coupling and splitting is not equivalent: coupling takes more time than splitting.

The main reasons are:

- ✓ The process of coupling takes more time because the second train behind the first train parked in the station must pull in at low velocity and usually with restricted signalling.
- ✓ In order to make up little delays and to stabilize the robustness of the paths diagram, dwelling time at station must be artificially increased by the first train waiting to be coupled by the second train behind it. In this case the track occupation time is mechanically increased.

Of course the time required for a coupling depends on the station of coupling: the bigger the station is, the more the time of coupling will be. Basically in France, depending on the station the time needed for coupling varies between six minutes to ten minutes, but rarely more.

In France the National Railway Company (SNCF) permits the train awaiting another train delayed by a significant amount to leave the station in order not to be affected by the delay.

Obviously also, in order to have an efficient splitting and coupling operations, the switch moving has to be efficient too.

In term of cost, the saving is also obvious because only one driver is needed instead of two in case of coupling. In case of splitting, 2 drivers are needed wherever the splitting takes place, which means the service is adapted with reduced time schedule for the second and potential re-use on other service.

The main saving is coming from the fact that the operator can tailor the service to demand, planning multiple trains where it is really required by the number of customers, and limiting the service of trains where the number of passengers is reduced to a single unit. If 2 trains are coupling, only one schedule slot is required while it is possible to transport twice as many passengers. This is very advantageous on lines subject to heavy demand where schedule slots are limited. This allows release of infrastructure capacity so slots are available for another train.

To conclude, considering the 3 cases of splitting and coupling operations (illustrated in chapter 5.3), the benefit of these operation plans arises from:

- ✓ The reduction of the operation cost, because the two trainsets are driven by just one crew instead of two,
- ✓ The capacity consumption of the line is decreased by 50%, as a single schedule slot is needed instead of 2 on the common route,
- ✓ The presence of 2 sets of power cars on the common route, which practically excludes any failure of the equipment.

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5.7 *Passenger information*

On board high speed trains, all passengers have to be seated for safety reasons. Booking is mandatory with designated coaches and seats. In addition on the coaches side the destination and services are clearly displayed which helps customers to cross-check with their ticket and coach numbering (on each issued ticket is mentioned the number of the coaches and seats).

Before the boarding and at the access to the platform and also in the station, the cities served by the train are displayed on information screens. Painted numbers on the platform show where the coaches will stop inside stations. helping the passengers to wait in front of the proper coach and facilitating the boarding.

Passenger confusion is extremely rare. A systematic reminder of the train destination after every stop, through the on-board sound system and in the station, is made in order to avoid any confusion.

5.8 *Frequency to San Francisco Bay Area*

As mentioned earlier in this chapter, trains coupling or splitting is a source of large savings on operating costs, adapting the service to the demand. Customers' confusion risks are extremely minor. It rationalizes also the use of the route and it is facilitated by the high performance signalling and public information system which is anyway required for High Speed train operation. Moreover, we have a power reserve in case of mechanical failure.

Indeed, California like France has major urban destinations (especially Los Angeles, San Francisco and San Diego) and the distance between them are similar to the largest cities of France. California, as a State similar to France in term of density of population and area, is well appropriate for this kind of service

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6. Conclusion

For the operation of a high-speed rail service, the route through Altamont has many more advantages than the Pacheco plan. Providing a service which employs trainsplitting could increase those advantages for the Altamont corridor. This is particularly because that configuration of a common line from Los Angeles to San Joaquin County with branches serving Sacramento, San Jose and San Francisco has the classic dividing corridors pattern which characterizes much of the southeast of France, home of the most efficient rail service in Europe.

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7. Setec team

This report has been developed by:

Philippe Voignier:	Head of expertise
Jean-Pierre Paszko:	Systemwide
Jean Bernard:	Civil works
Michel Legendre:	Operation
André Guilsou:	Environment
Christophe Perreau:	Alignment

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8. Appendices

Appendix A : Altamont Pass plans (General plan and plans 1 to 5)

Appendix B : Fremont route along SF Water Line

Appendix C : Fremont route along SF Water Line – Cross Section according to French Standards

Appendix D : SETEC's railway references

Appendix E : Individual CVs

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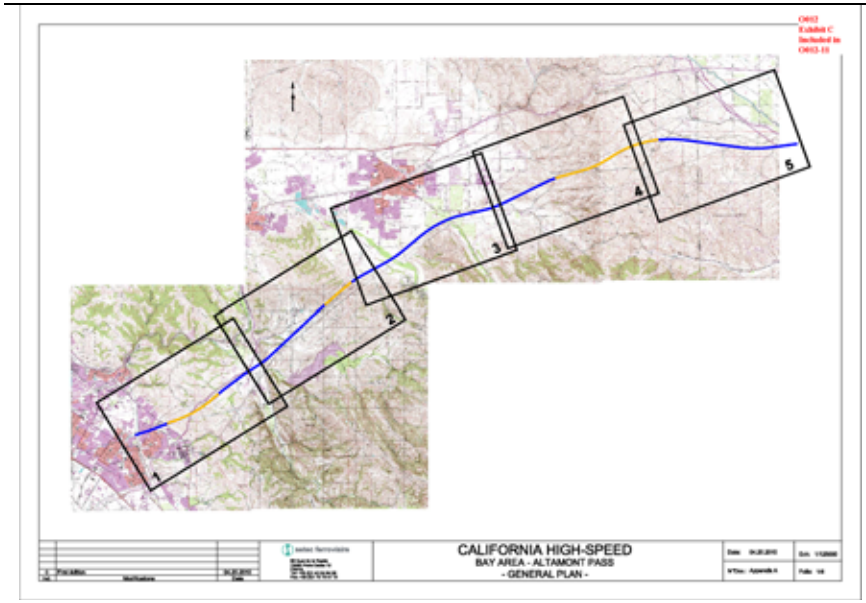

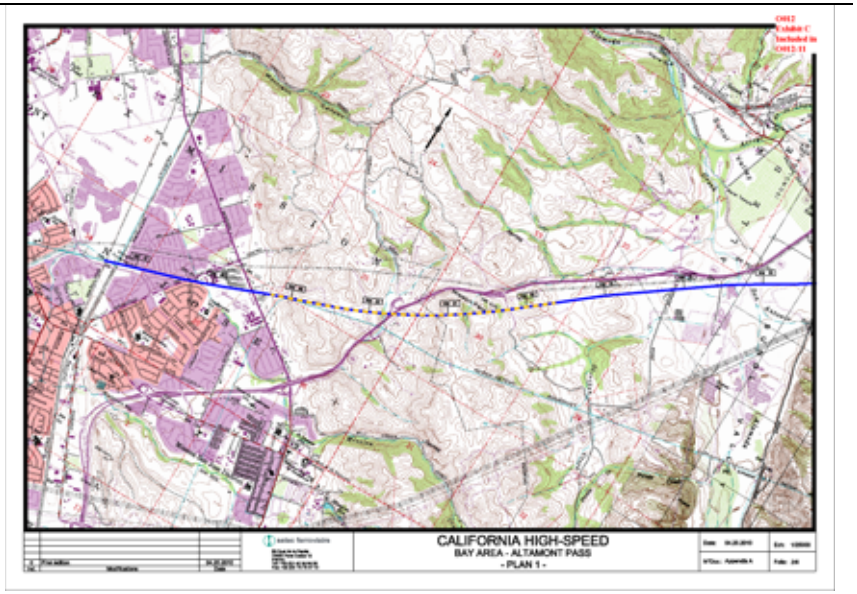

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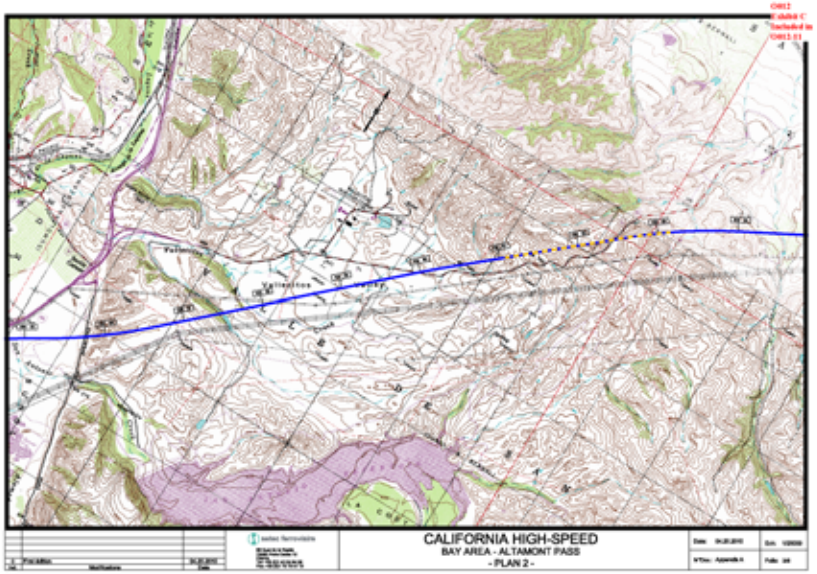

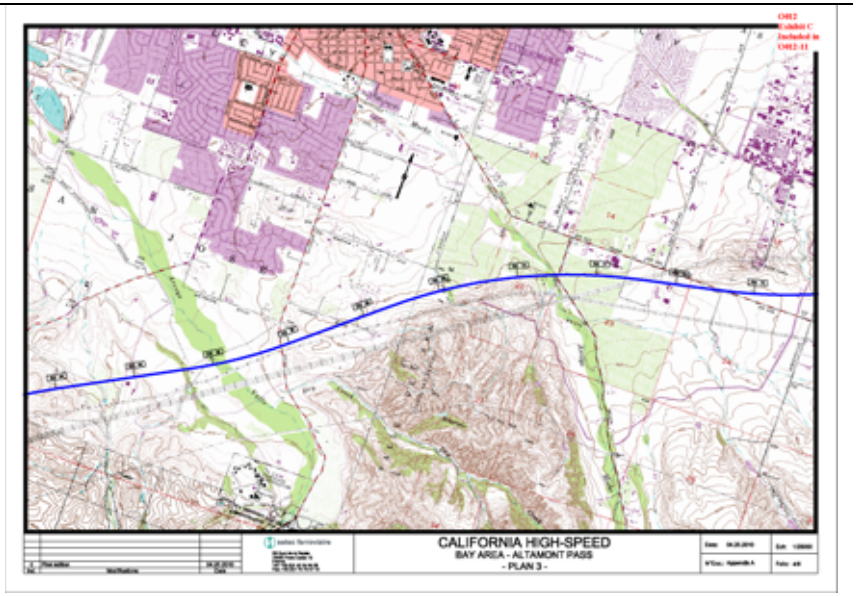

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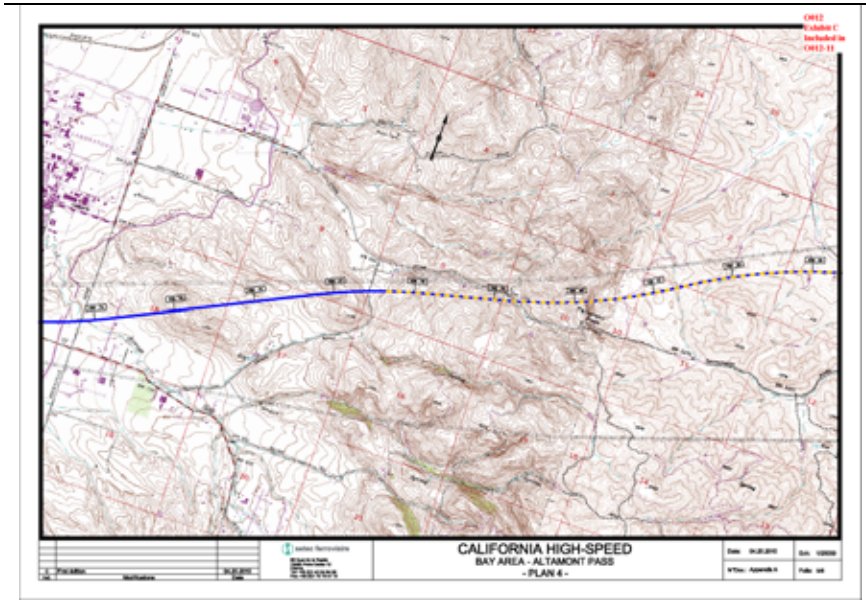

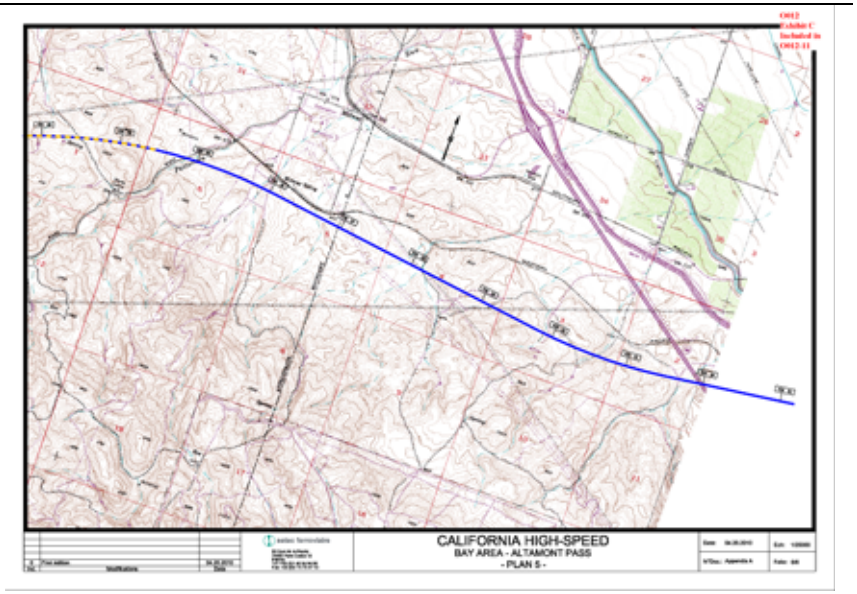

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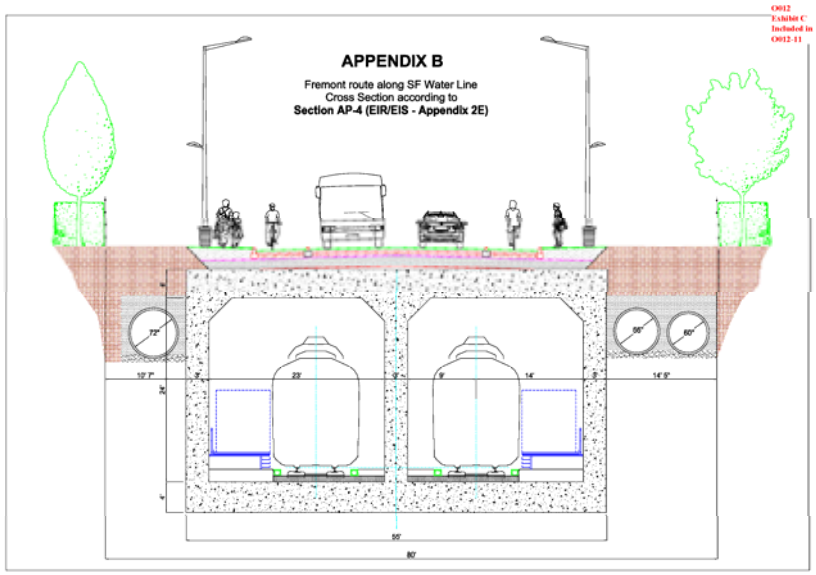

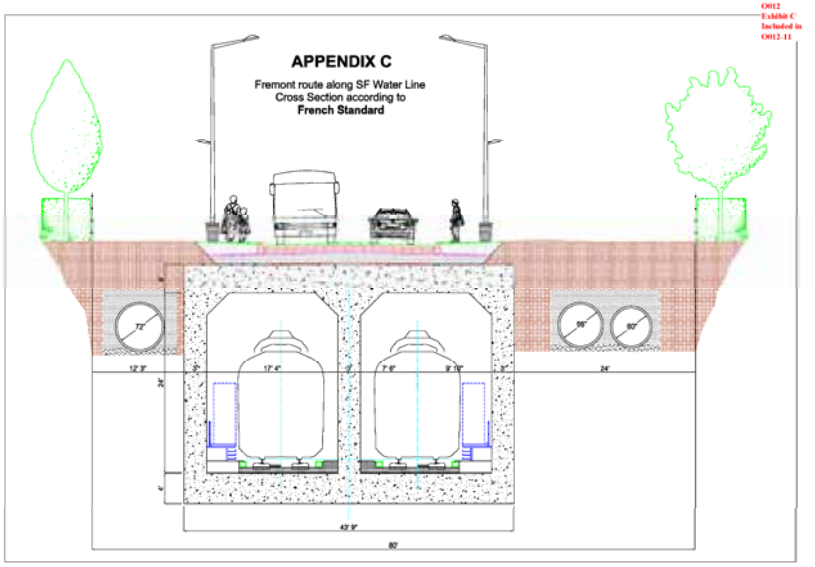

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HSR Infrastructure Expertise

Appendix D: SETEC's railway references

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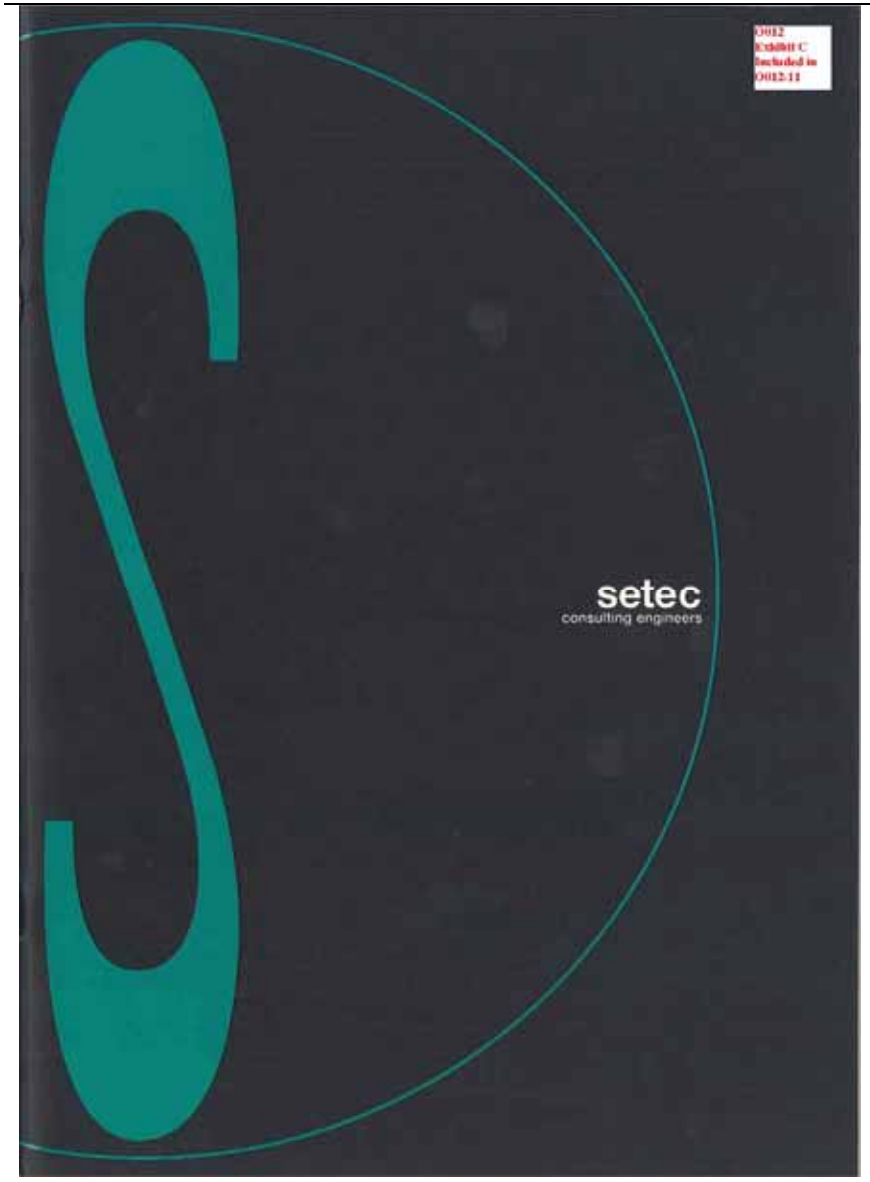

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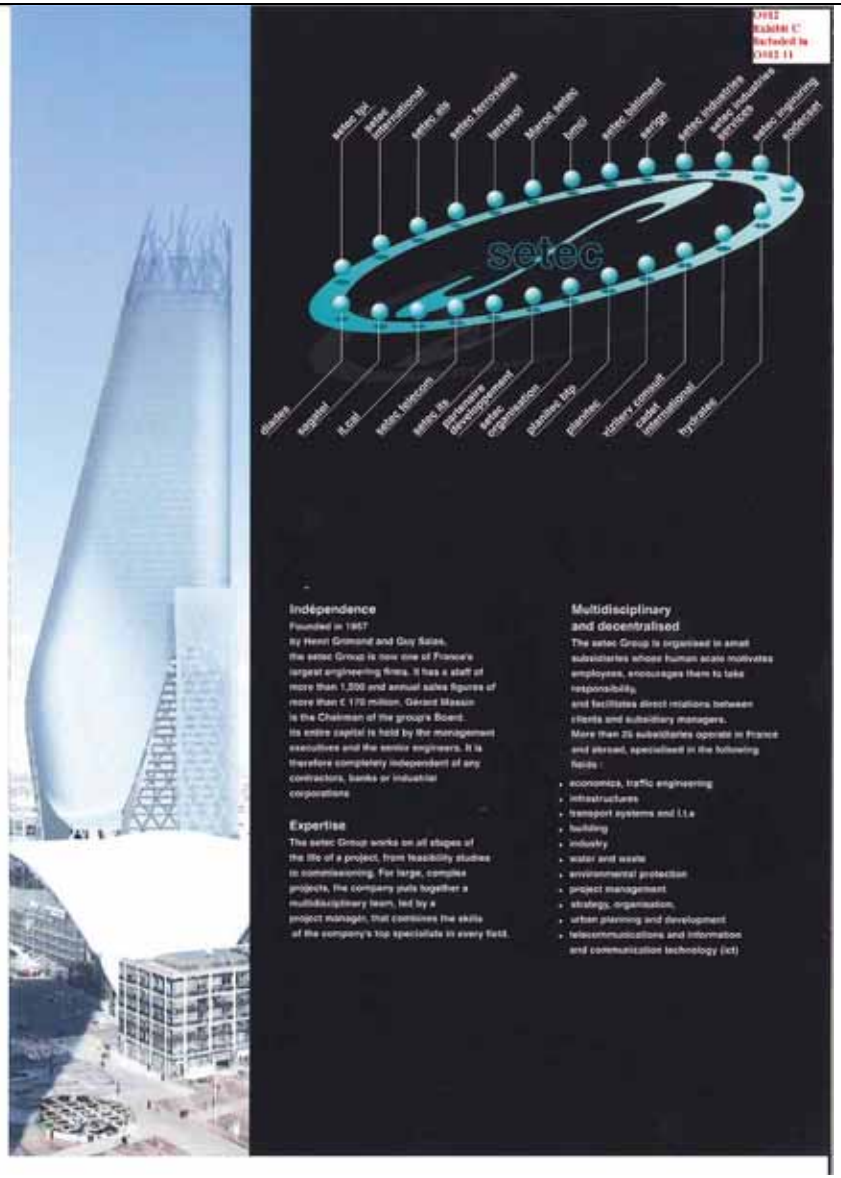

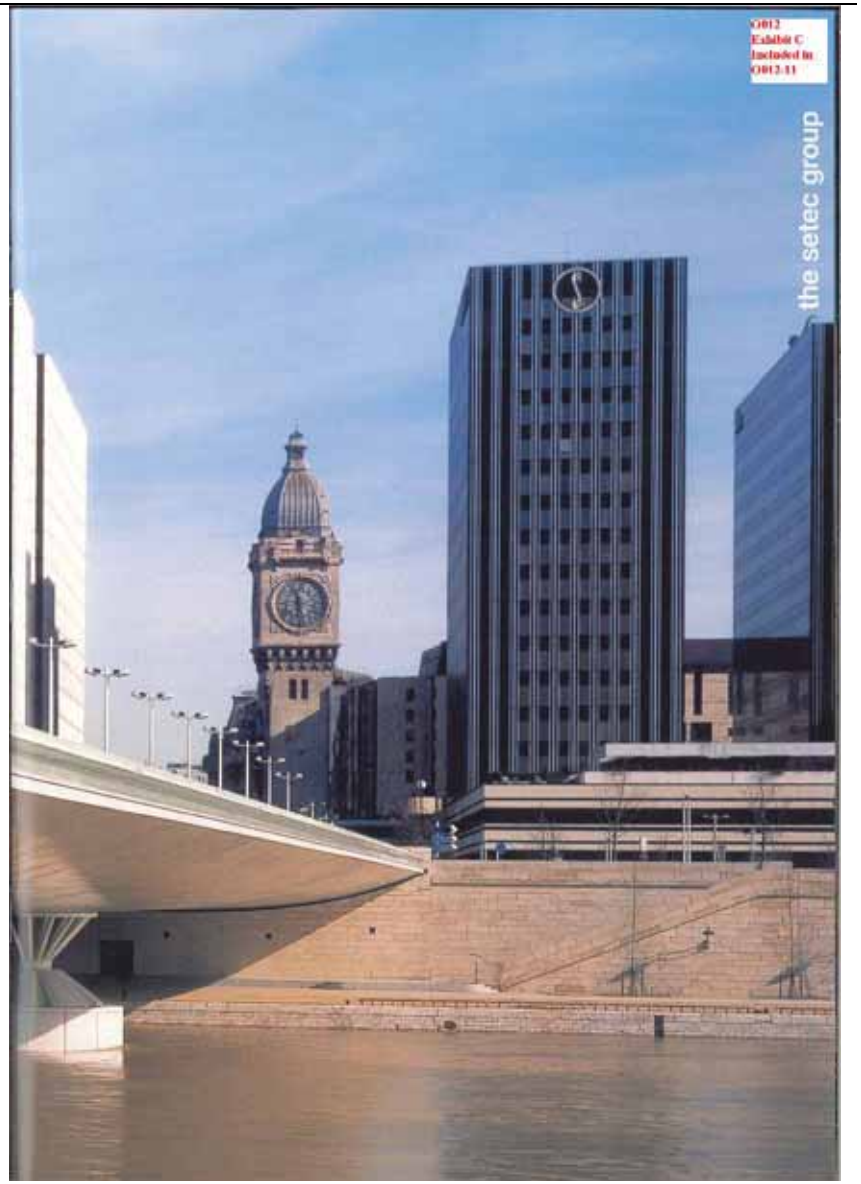

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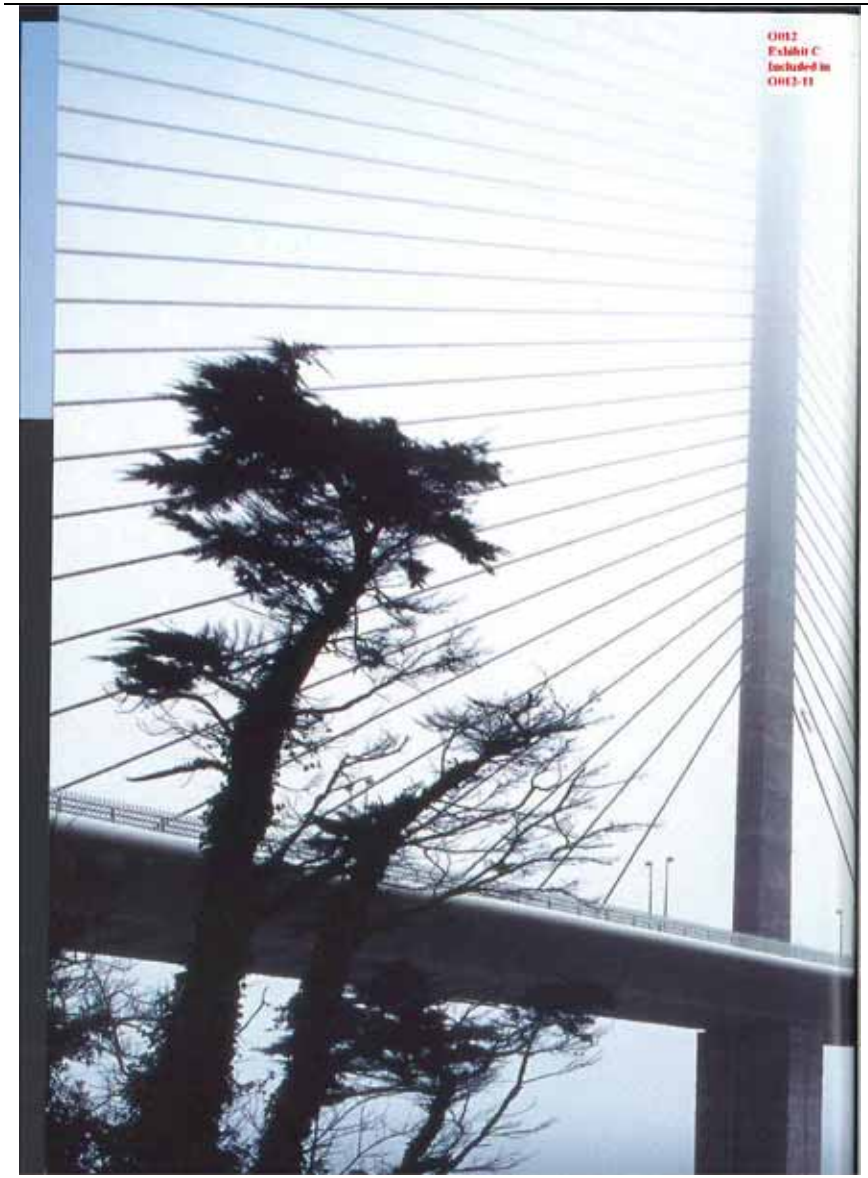

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references

Project management consultancy

- Assisting public and private clients with project organisation, procedures, cost controls and scheduling (e.g., Rff, Ast, Sapr, Sftrf, Sapn, Sanef, Sncf, Eurotunnel, Vinci, Pfizer; local authorities and public works agencies, etc.)
- Architectural and functional planning (e.g., libraries, museums, universities, Beijing Olympic Organising Committee, Airbus, Radio France, Hermès, Cité des Sciences et de l'Industrie, etc.)
- Urban planning, management and development (e.g., development studies, Territorial organisation coordination plans, Local urban plans, Urban development plans, project organisation and management, etc.)

Project management

Project management covers all methods and systems for managing schedules, costs, risks, performance and quality.

- Project management for infrastructures (railways, Tgv high-speed railway lines, roads, crossings, transport systems, urban development schemes), public and private buildings, etc.
- Codes of procedures
- Audits of large projects (Turin underground railway, Rouen tramway, Caen Tvr guided light rail system, new city business district in Moscow, Charles de Gaulle express, Pau-Langon motorway, etc.)
- Assistance with transfer of business activities (Ccf, Quai Branly Museum, etc.)
- Industrial project management (Dcn, Psa, Cea, Eumetsat, Snecma, Eurocopter, Renault-Trucks, etc.)
- Scheduling, supervision and coordination (Edouard VII, Olympia, Grand Louvre, Cartier Champs Elysées, Roissy CdG, Grand Palais, Dourges intermodal transport hub, shopping centres, offices, hotels, etc.)

Strategy and organisation

- Transport strategy and organisation
- Positioning and strategy of local government authorities
- Audit, consultancy and training in organisation and revitalisation of human resources with local government authorities, central government bodies, state-owned and private companies, international bodies (Ministry of Defence, Ministry of Finance, National Police, local authorities in Paris and elsewhere, Rff, Véolia, Escota, etc.)
- Organisation of projects (definition of processes and organisations, selection of software tools, supervision of work loads, etc.)

General studies

- Master transport plans, national transport plans (Ivory Coast, Niger, Morocco) and – regional transport plans (Ile-de-France – Rhône Alpes – Provence-Alpes-Côte d'Azur – Vendée – Loire Atlantique – Guyana)
- Modelling and forecasts of traffic on major crossings (French-Italian Alps, Lyon-Turin, Pyrenees, Perpignan-Figueras, Gibraltar, English Channel), underground urban railways (Marseille, Lille, Toulouse), Lgv high-speed railway lines (Aquitaine, East European, Picardy, Brittany), numerous motorways in open countryside (metropolitan France, La Réunion, Hungary, Lebanon, Poland, Portugal, Azores, Russia) and in urban areas (Muse in the Ile-de-France region, Prado-Carénage Tunnel in Marseille, Bpnl in Lyon, Tokyo, Greece, Poland, Turkey, Senegal, Dominican Republic)
- Techno-economic feasibility studies for roads, railways and urban public transport systems in France and abroad
- Socio-economic studies, cost-benefit studies, financial projections, operational research and surveys

Urban planning and transport

- Planning of Lyon Confluence and of Boulogne-Billancourt
- Planning of new towns (Evry, Cergy Pontoise, St-Quentin-en-Yvelines, Villeneuve d'Ascq, Bahrain) and of mixed-development areas of all kinds
- Urban renewal (Villetaneuse, Gpv in Lyon-La Duchère and Rillieux La Pape, O.R.U. in Orly-Choisy, etc.)
- Tourism development and planning (restructuring of the Cap d'Agde station, reorganisation and development resources in Morocco, revision of the tourism strategy in Tunisia, seafront in Menton, etc.)
- Urban parks (La Villette, Tuileries and Carrousel, Château de Méry)
- Urban transport plans: Ile-de-France, Toulouse, Le Mans, Tours, Narbonne, Monaco, etc.
- Light underground urban railways in Lille and Toulouse (Val Light Automated Train)
- Metal-wheeled tramways (Tunis, Rouen, Nantes, Orléans) and rubber-tyred tramways (Caen, Nancy), TransVal de Marne
- Bus rapid transit system on a dedicated corridor (Douai)
- Intermodal stations and interconnection points (Vannes, Saint-Malo, Nantes-Sud, Armentières, Cannes-La-Bocca, Issy-Les-Moulineaux, Cheiles, etc.)
- Catenary aerial power lines for trams (Lyon, Saint-Etienne, Limoges)
- Depot workshops (Saint Etienne, Nantes, Clermont-Ferrand, Limoges, Valenciennes)
- Renovation of rolling stock (Lyon bus and trolleybus systems, Marseille underground railway)

Infrastructures

Roads and motorways

- In France:
  A43 in Maurienne;
  A28 in Eure;
  A29 in Aisne and Somme;
  A87 in Vendée;
  A89 in Dordogne;
  A41 in Haute-Savoie;
  A86 in Ile-de-France;
  A8 in Provence
  A4 in Champagne
- Abroad:
  more than 6,000 km in 20 countries (Tunisia, Ivory Coast, Algeria, Morocco, Iran, Haiti, etc.)

Bridges and viaducts

- Bizerte bascule bridge (102 m span – a world record)
- Preliminary design of Verdon bridge (10 km)
- Motorway and railway viaduct between Denmark and Sweden (7,8 km)
- Millau viaduct (2,5 km)
- Design calculations for large deflection of Normandy bridge and complete design calculations for Elorn bridge (Finistère area of France)
- Numerous road and railway structures in Algeria, Benin, Brazil, Cameroon, Ivory Coast, France, Haiti, Iran, Luxembourg, Syria, Tunisia, Usa

Tunnels

- Fréjus road tunnel (12,8 km)
- English Channel tunnel (52 km)
- Puymorens road tunnel (3,9 km)
- Oresund underwater tunnel (3,4 km)
- Éole: Tunnel and underground railway stations (Paris)
- Gaikan by-pass (Tokyo)
- Vuache tunnel renovation (1,4 km) (in French Alps)
- Saverne tunnel (4 km)
- Radioactive waste storage (Andra) (80 km of tunnels)
- Toulon tunnel (second tube)

Railway infrastructures

- Lille and Marseille railway stations
- Lgv high-speed railway lines in France, Spain and Italy
- Railways in Algeria

Seaport and riverway infrastructures

- Port Hercule (Monaco)
- Large-gauge canal lock (Vnf)

Airports

- Runways at Roissy Charles-de-Gaulle, Lyon-Satolas, Nouadhibou (Mauritania), Istanbul-Yesilkoy, Tunis-El Aouina, Monastir and Djerba (Tunisia)
- Airports (with Paris Airports Authority): Nouasseur (Morocco), Shanghai (China), Abu Dhabi (United Arabs Emirates), Catane (Sicily), Ekaterinbourg (Russia);
- Vatry Europort (France)
- Aeroconstellation mixed-development area, Toulouse (France)

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references

Buildings

- Arts buildings: Grand Louvre, Musée d'Orsay, Institut du Monde Arabe, Opéra Bastille, Luxembourg Philharmonic Hall, Palais Garnier, Foundation Pinault
- Administrative buildings: Ministry of Finance, French embassies in Bahrain, Mexico, Moscow, Riyadh, Tokyo, Baku
- Offices: Atlantique-Montparnasse, Gaz de France head office, Etoile-Saint-Honoré, tower blocks at La Défense, Paris (Société Générale, Scor, Crédit Lyonnais, Cœur Défense, Pb6, Pb12, Cb16, Cbx)
- Hospitals: France (Annecy, Mulhouse, Saintes, Toulon, Rennes, Antibes, Assistance Publique des Hôpitaux de Paris, Hospices Civils de Lyon), Algeria, Egypt
- Educational buildings: secondary schools and universities (Paris, Nancy, Casablanca, Tunis)
- Sports facilities: stadiums in Toulouse, Canton, Casablanca, etc.
- Hotels: Méridien, Lucien Barrière, and Club Méditerranée chains
- Conference and exhibition centres: extension of Palais des Congrès in Paris, Halls 6 and 7 of the Paris-Nord-Villepinte exhibition park, Hall 5 of the Porte de Versailles exhibition park
- Shopping malls: Passage du Havre in Paris, Quatre Temps in La Défense, Chv in Châlons-en-Champagne, Ikea in Metz
- Housing: residential complexes in France and abroad
- Car parks: La Défense, Orly, Tignes, etc.
- Abroad: Lycée Français in Moscow, Marinsky Theatre in St. Petersburg, Grand National Theatre in Beijing, tower blocks in Teheran, hotels in Tunisia, hospitals in Egypt

Industry

- Factories for IBM, Raychem, Électronique Serge Dassault, Motorola, Hitachi, Eads, STMicroelectronics, Pôle Minatec, Psa Design Centre, Rungis Market, LaserMegaJoule Project (Cea/Atomic Research Centre)
- Laboratories for Pfizer, Servier, L'Oréal

Environment

- Environmental studies of motorways projects (A16-A26-A29-A43-A51-A87-A89)
- Environmental studies of Lgv high-speed railway projects (Mediterranean, Rhine-Rhône & East European lines)
- Environmental studies of main roads (Rn17 – Rn59 – Rn88)
- Environmental assessment and monitoring of motorways in use (A41-A51-A57)

Water

- Urban sewage disposal master plans and diagnostics: several towns in the Greater Paris area, Nantes, Cholet, Aix-les-Bains, Belley
- Sewage treatment plants of all sizes: Siaap Valenton, Achères, Colombes, Nantes, Caen, Tours, La Ferté-Bernard, Villeparisis, Provins
- Storage and regulation reservoirs: Lille, Nice, Laon, Paris
- River hydraulics: spate and flood control studies for the Seine, Loire, Arc, Oise, Marne and Rhône river basins
- River engineering structures: Le Maresquier on the River Orne, embankments on the River Oise and at La Bassée (on the River Seine)
- Management and protection of aquatic habitats: Marais-Vernier, Seine, Maurienne, Allier, Rhône
- Underground water: at La Bassée; quarry in Val d'Orléans
- Master plans for drinking water supply: Strasbourg, Tours, Limoges
- Drinking water transfers: Cannes area, Seine Amont-Marne, Ivry-Orly
- Drinking water treatment plants: Beaune, Corbeil, Nantes, Moussy
- Industry: Sewage disposal and treatment studies, water cycle studies
- Impact studies and Water Act studies
- Coastal engineering and marine environment: Port on Bassin, Cogema discharge at La Hague, hydrodynamic study of Monaco harbour main jetty.

Waste

- Multi-process recycling schemes (in France: Pas-de-Calais – Aisne – Côte d'Opale; Belgium)
- Optimisation of selective waste collection (Saint-Cyr-sur-Loire)
- Assistance with organising facilities for sorting, methanisation-composting, incineration and landfill disposal (Brussels, Lille Urban Area Authority, Lens-Liévin, Compiègne)
- Audit, expertise, research and development (Record)

Aeraulics

- English Channel Tunnel - Paris and Buenos Aires underground urban railways – appraisal of Mont Blanc tunnel – Lyon-Turin Railway tunnel
- Socatop tunnel (A86)

Intelligent transport systems

- Intermodal operation (Gcmd Grenoble, LePilote Marseille)
- Road operation: study and design of automatic equipment, electrical systems, telecommunication networks, toll systems, traffic management and supervision systems (Sirius, Allegro, Gutenberg, Erato, A75, A43, Toulon urban expressway, Normandy Bridge, Bpnl, A14, etc.)
- Public transport: automatic systems, signalling, electronic banking and ticket management system, traveller information and operation support systems (Grenoble, Paris, Marseille, Lyon, Valenciennes, Rennes, Strasbourg)
- Airport facilities: baggage sorting systems: Abu Dhabi, Nice

Telecommunications and Ict

(information and communication technology)

- Broadband optic communications networks (Maine-et-Loire, Midi-Pyrénées, Hérault, Cee Massy Saclay, Rff, Sicoval, etc.)
- Infrastructure telecommunications (Area, Cofiroute, Escota, Ratp, Sncf, Sanef, Sftrf, Alis, Aftrp, etc.)
- Local and regional government authorities (Rhône-Alpes-area Ict assessment; Cergy, Nice and Courly cable networks)
- High points and radiocommunications (Ratp, Rff, Sncf, Maine-et-Loire, etc.)
- Design and supervision of deployment of international telecommunications networks (Alstom, Gemplus, Rhodia, Casino, Veolia, etc.)
- Optimisation of company telecommunications services (Ministry of Agriculture, Lafarge, Bolloré, Cic, Compass, Société Générale, Ccip, etc.)
- Supervision of Ict system relocations (Indosuez, Cic, Caisse des Dépôts, Veolia)
- Telecom infrastructures of trading rooms (Cic, Paris Bourse, Cdc Ixis, Société Générale, etc.)
- Technical infrastructures of buildings (Cai, Cic, Tour Pbx, Bnp, etc.)
- Multimedia call centres and contact centres (Swisscom Mobile, Mobistar-Belgique, Cegetel Service, Société Générale, Caf, Nice Airport, etc.)
- Military telecommunication networks

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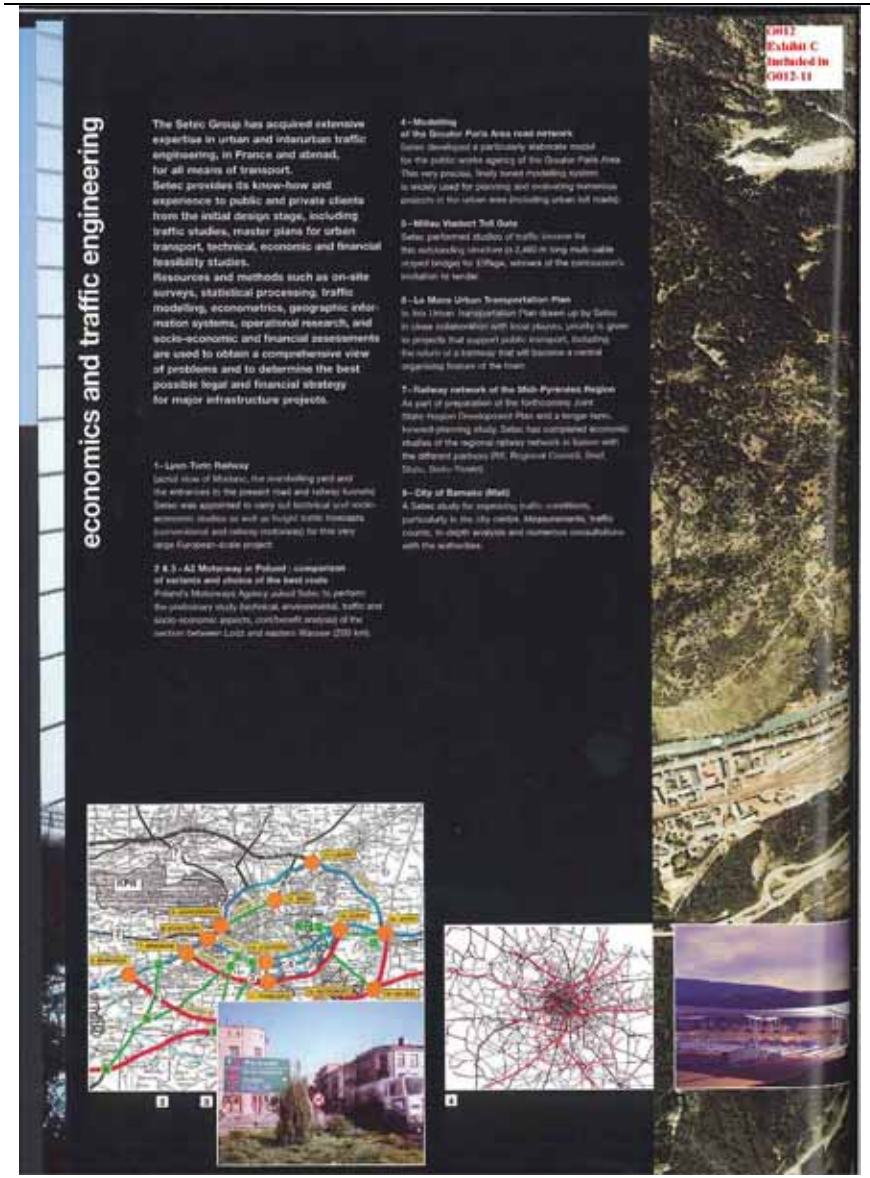

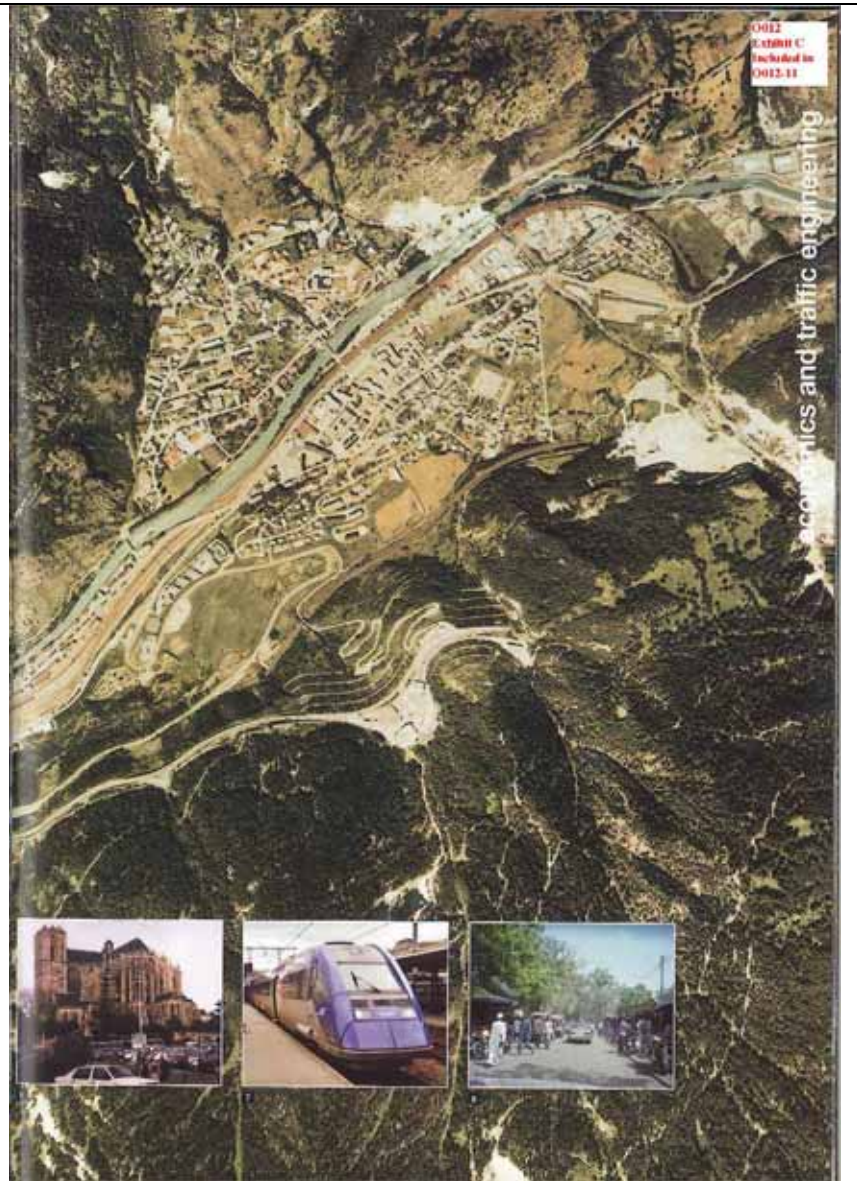

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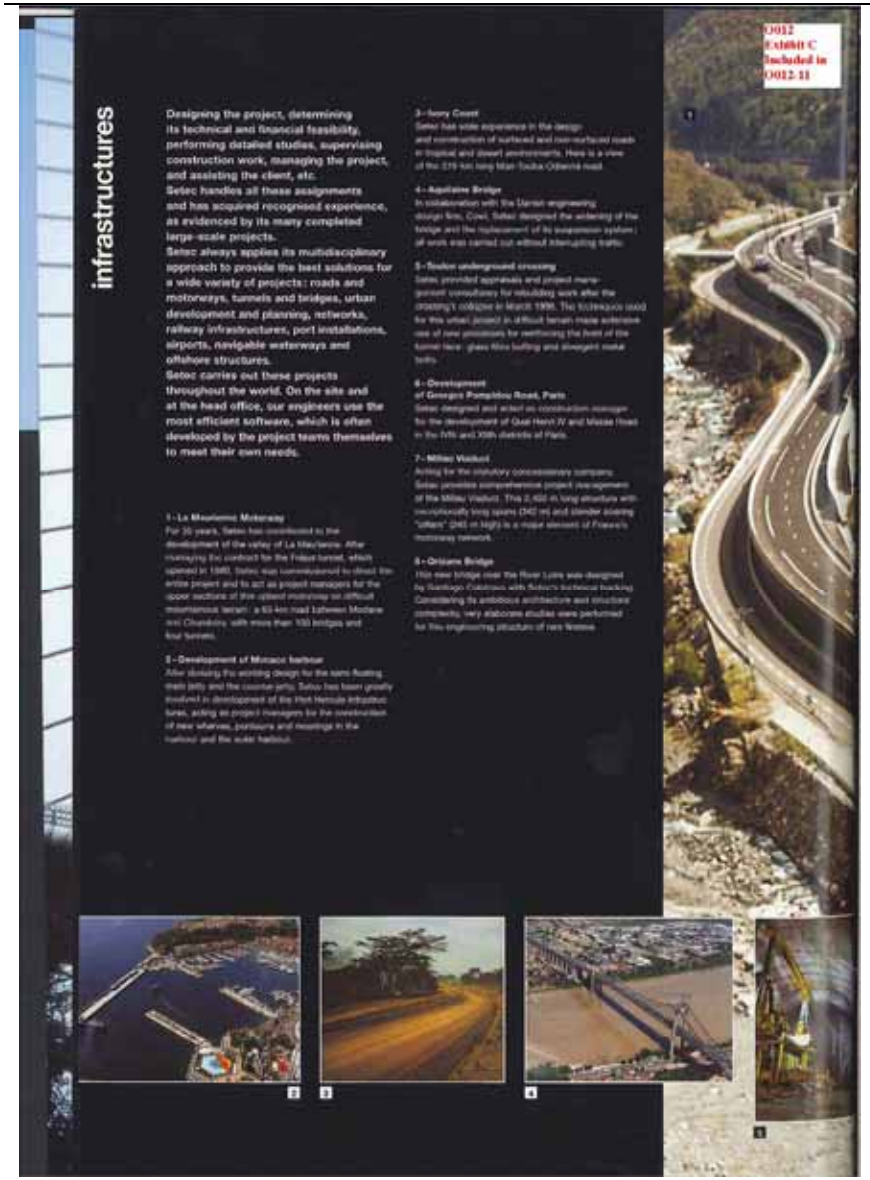

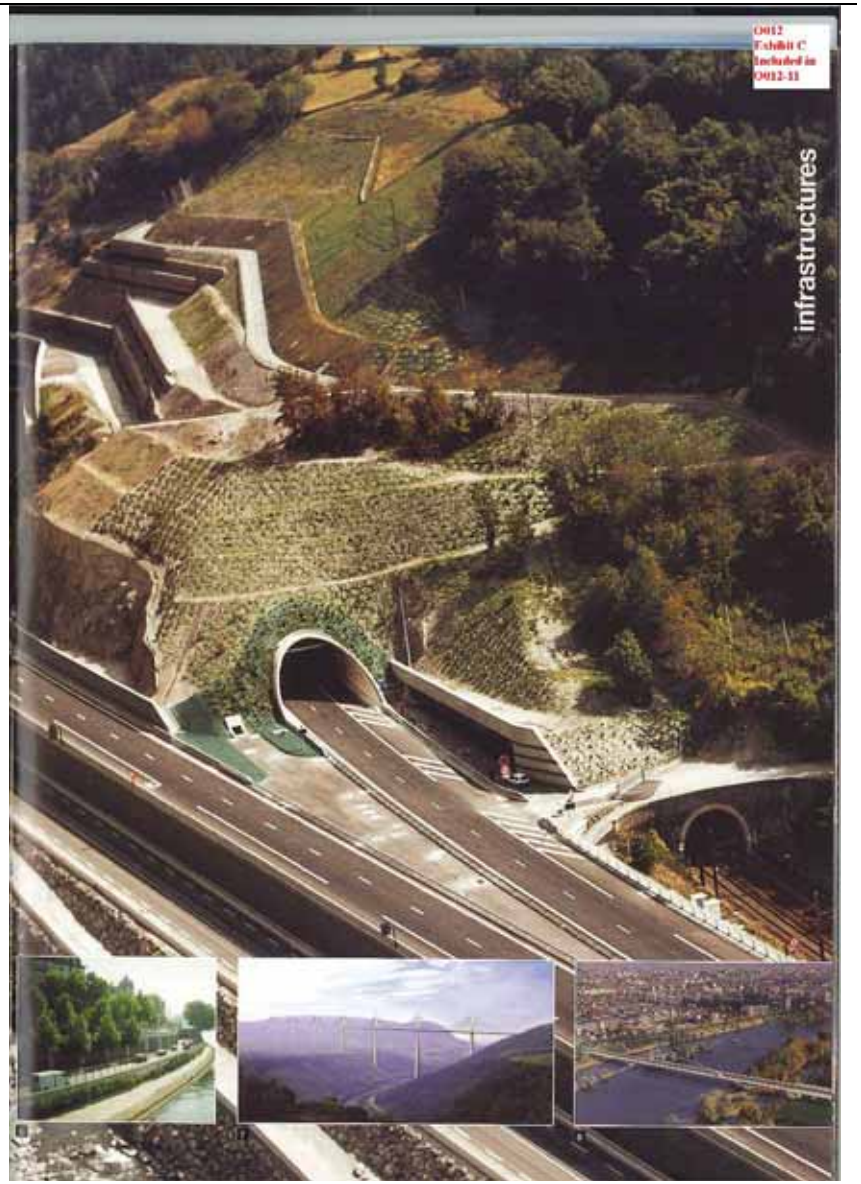

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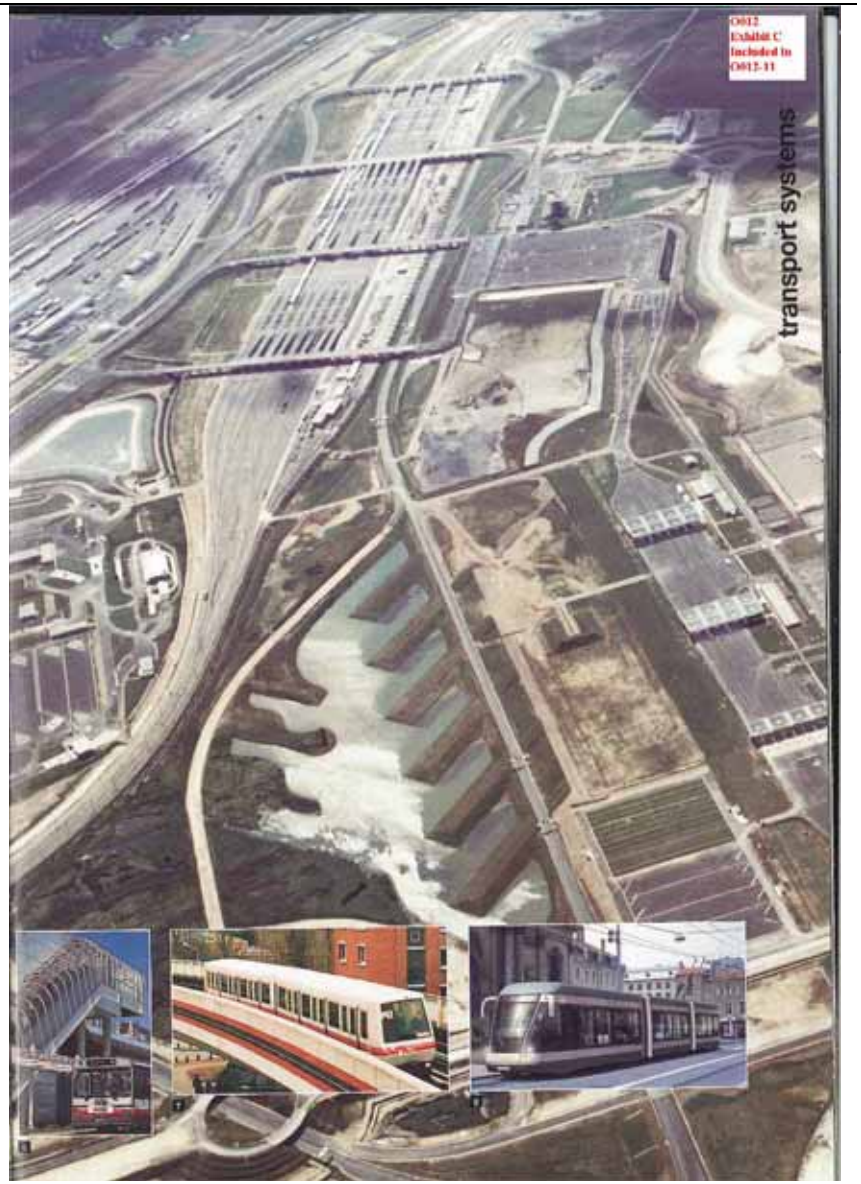

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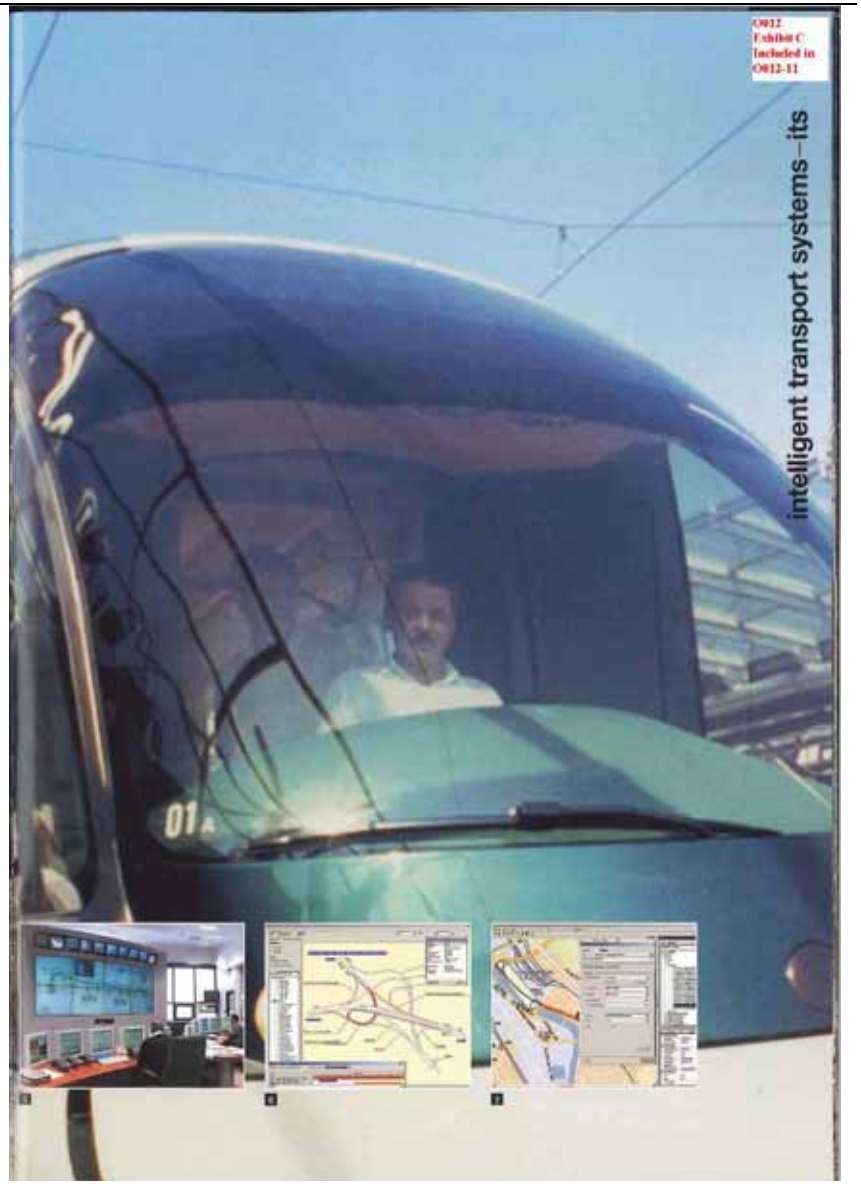

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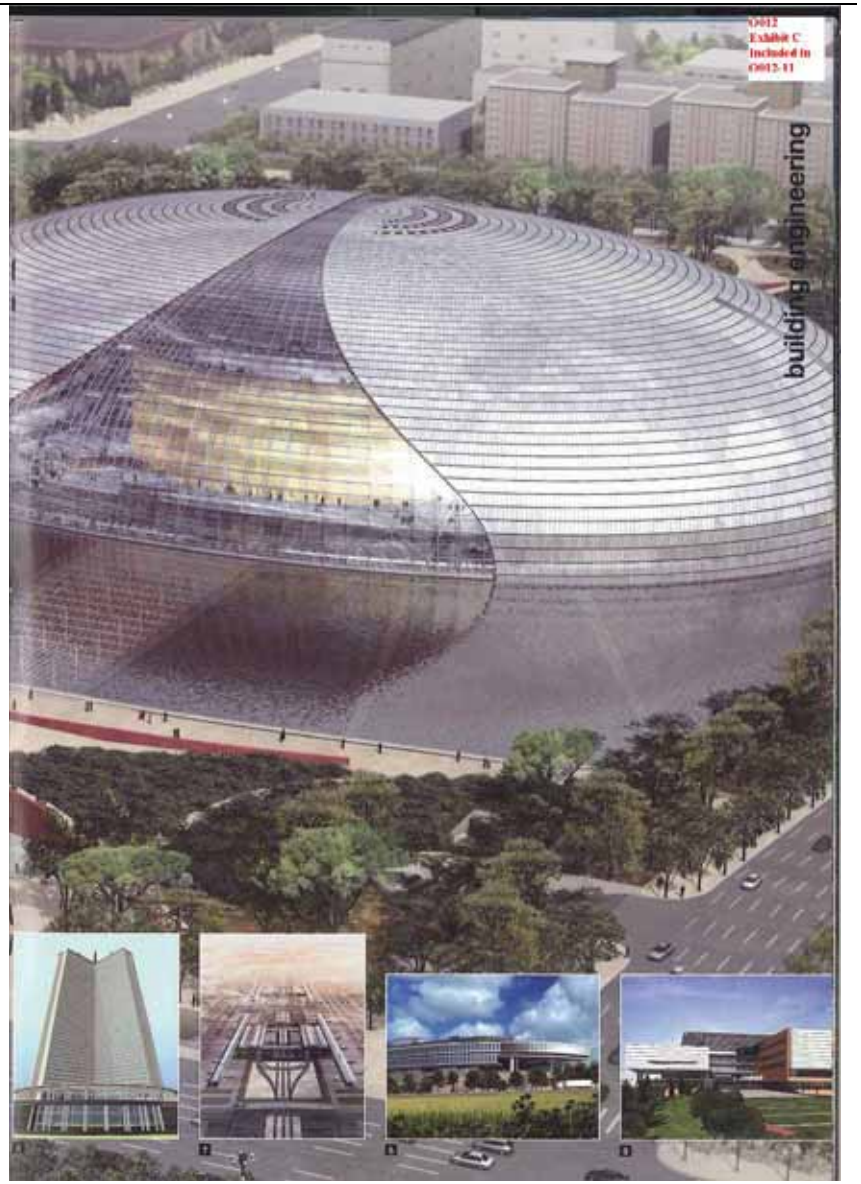

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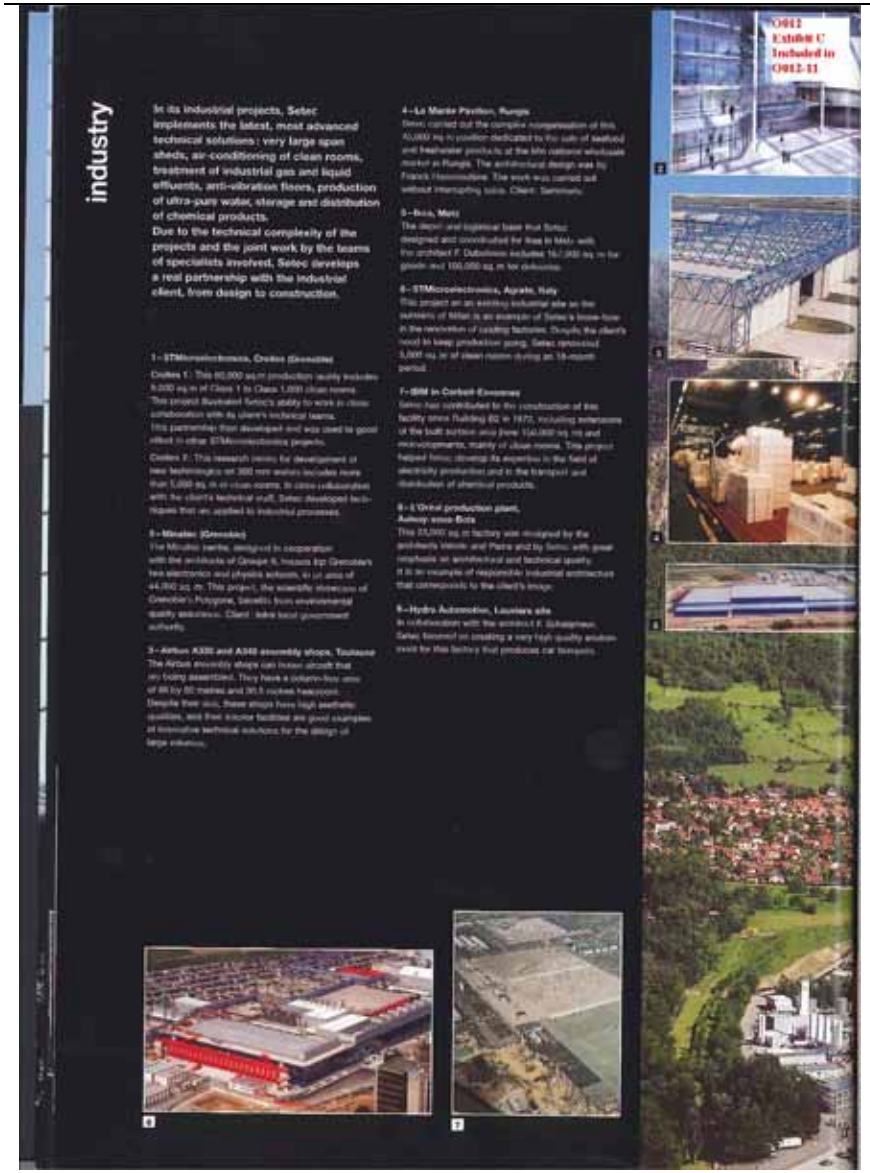

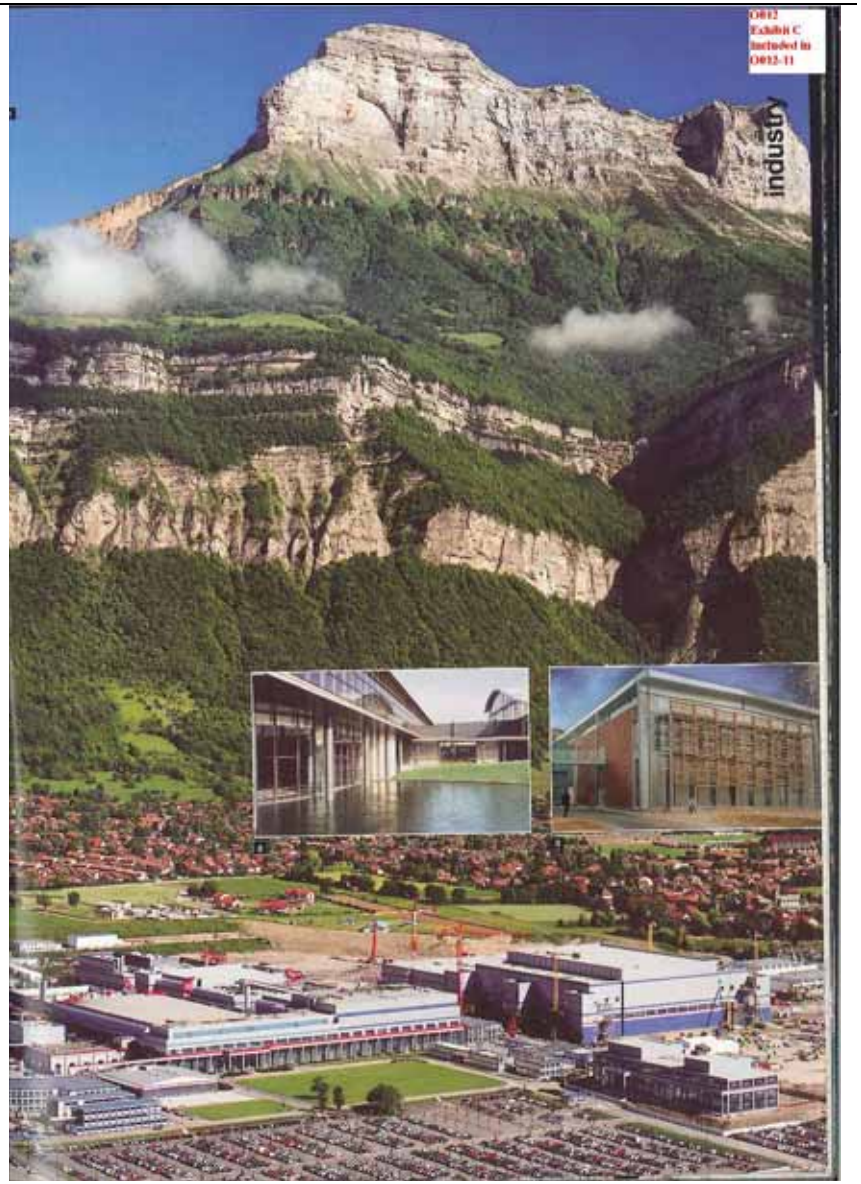

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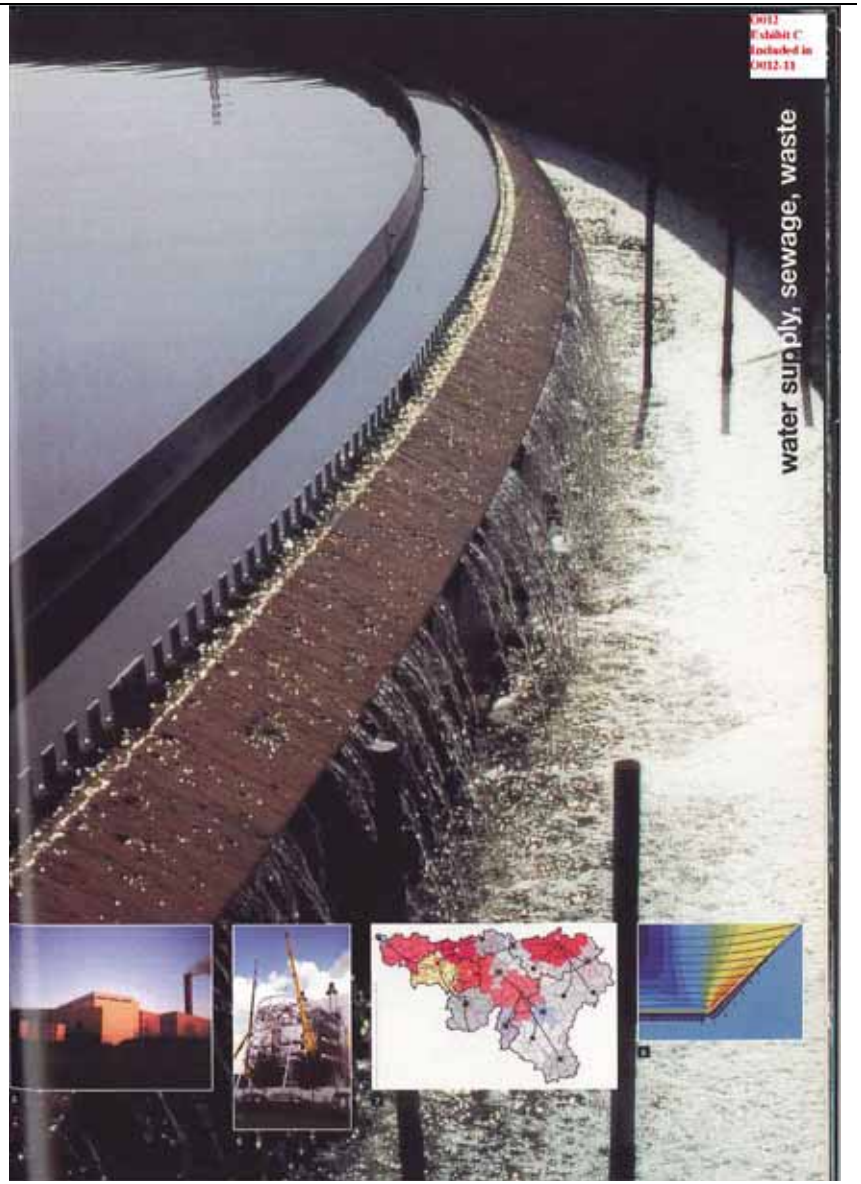

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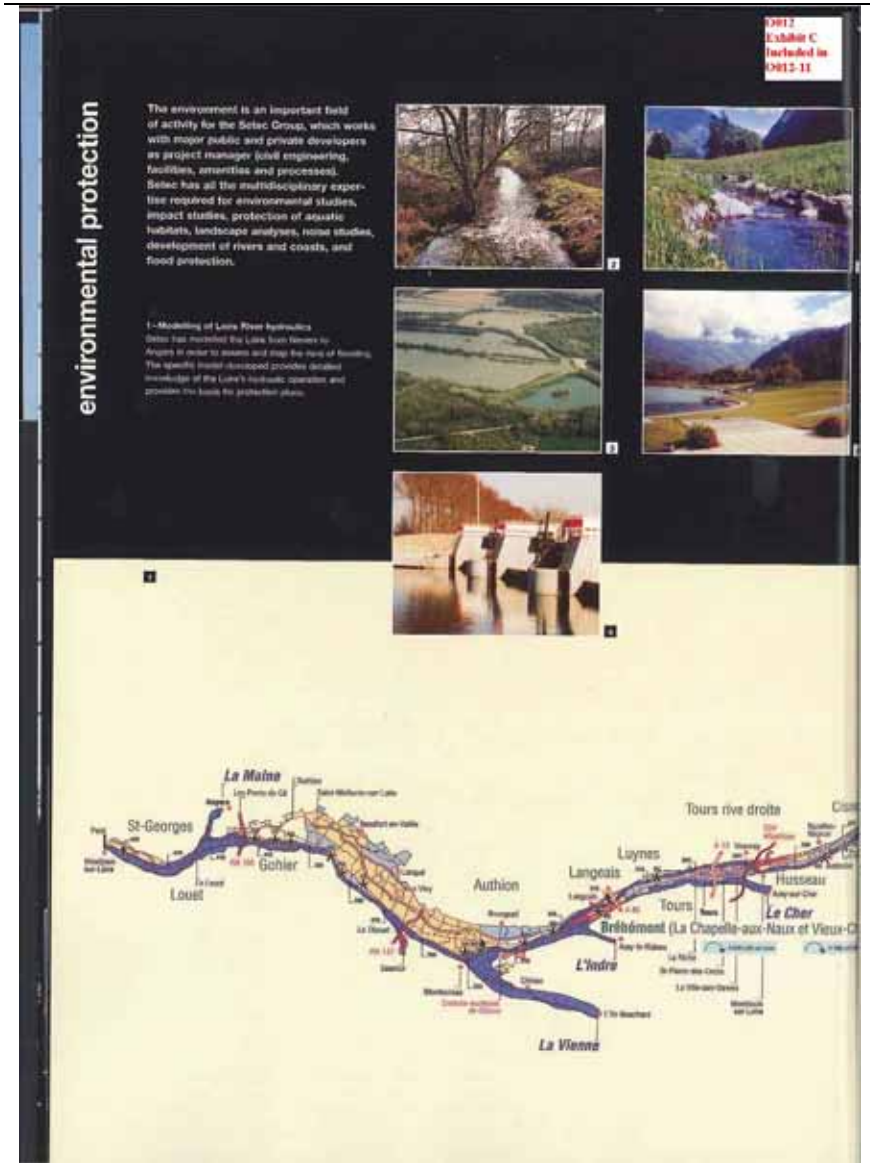

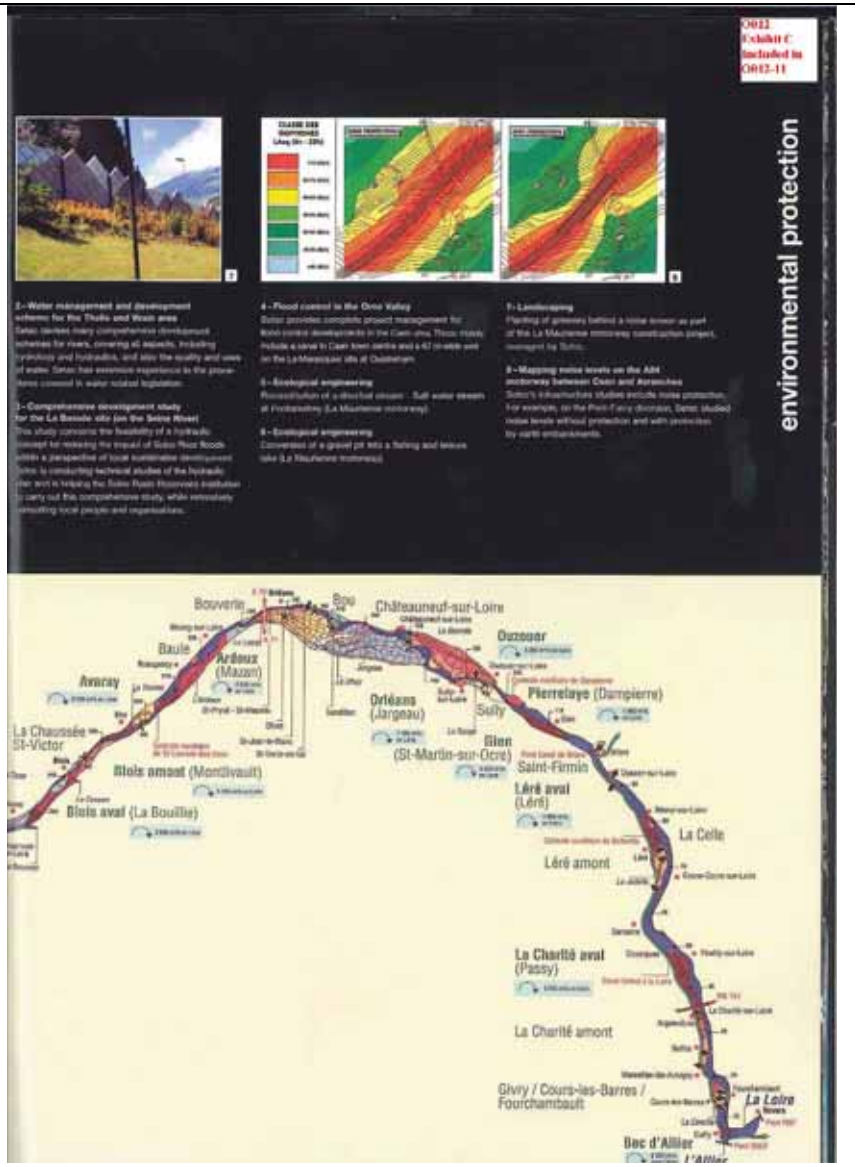

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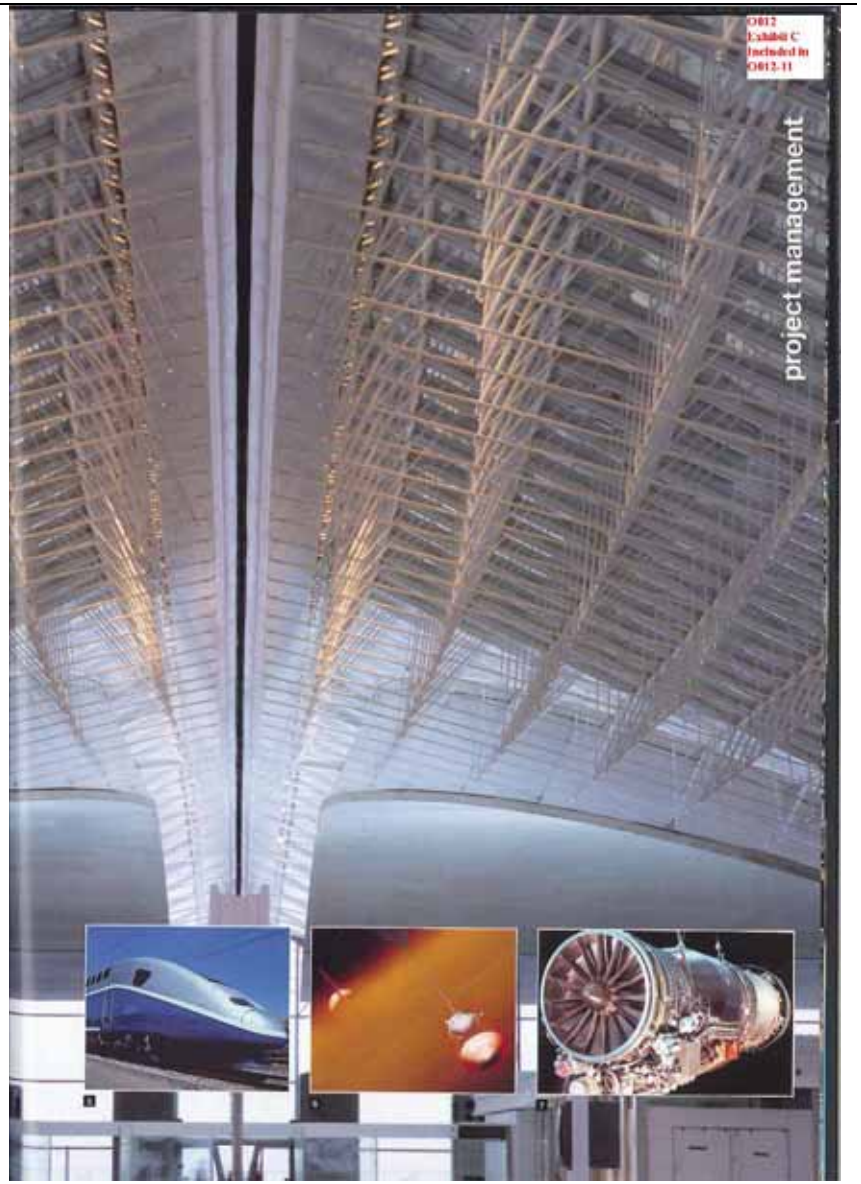

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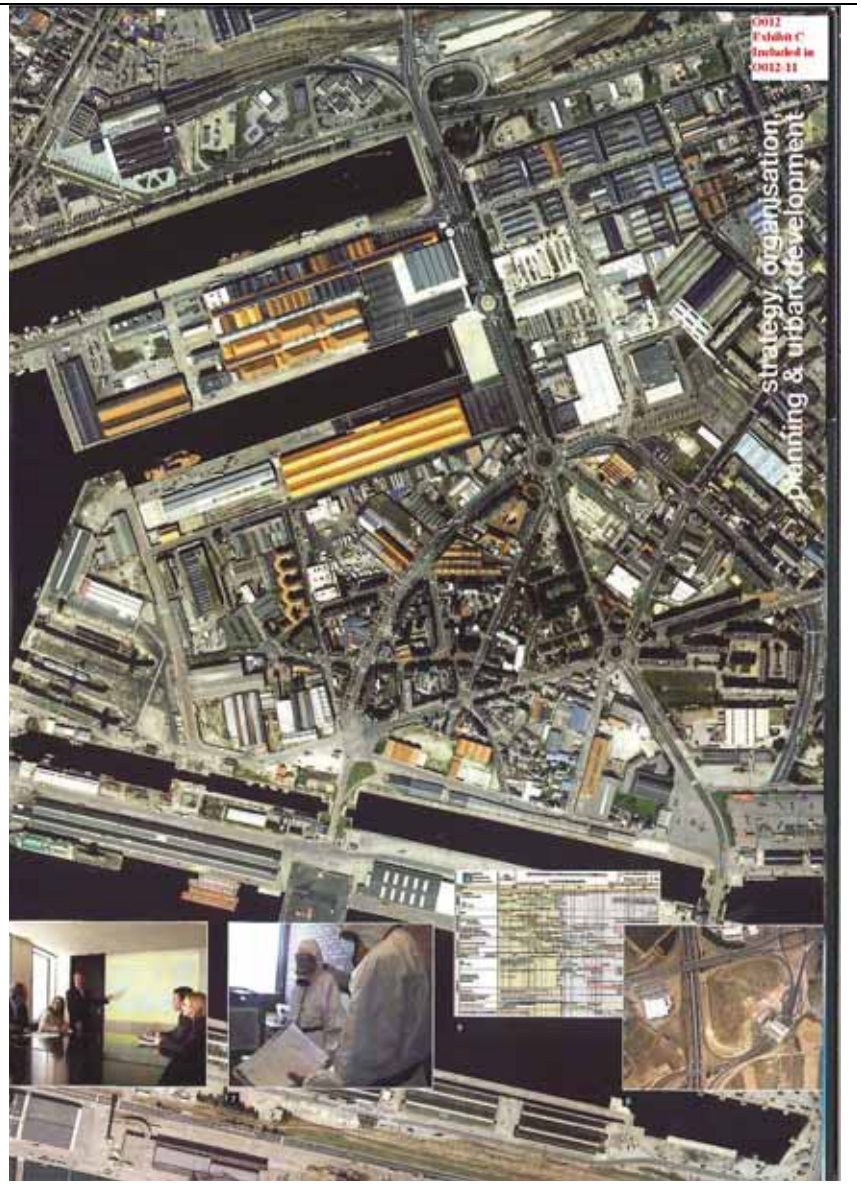

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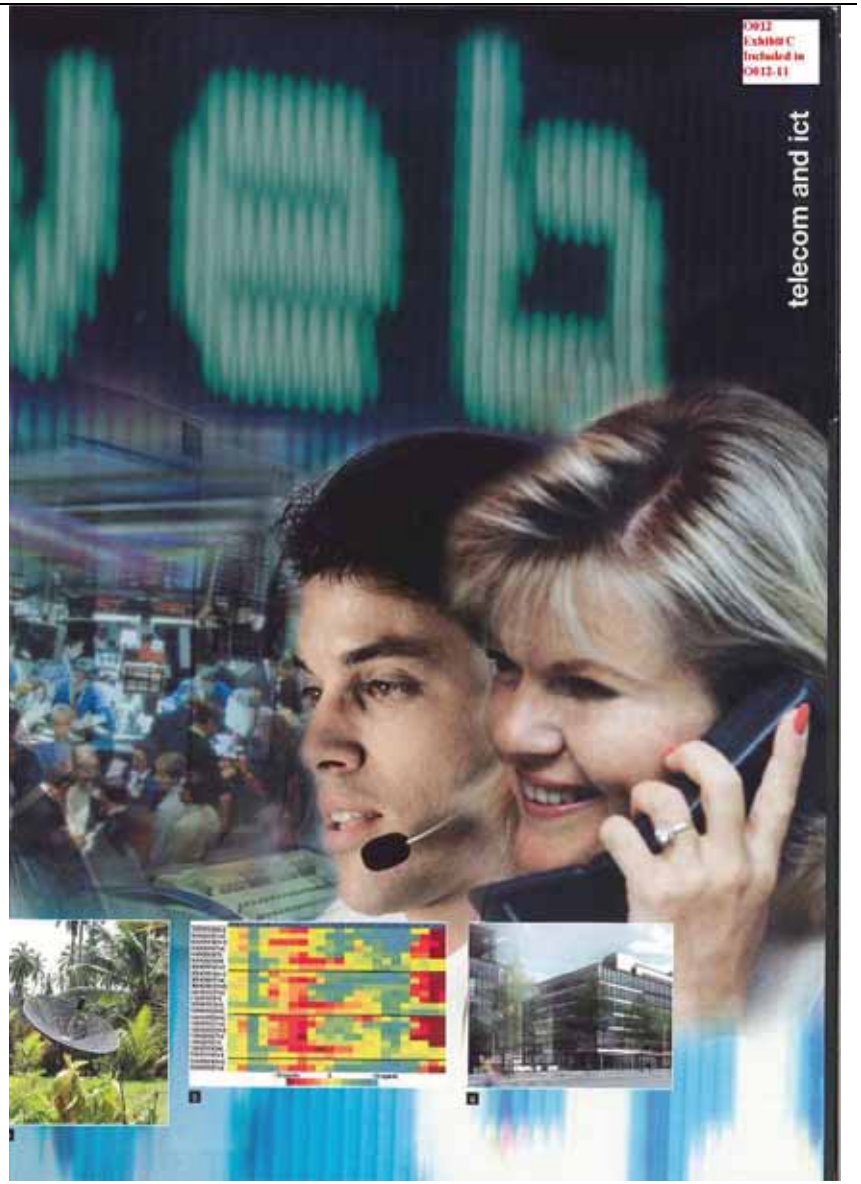

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- Urban networks
- Traffic studies, car parks.

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Large transport infrastructures
- Project management: roads, motorways, railways, underground urban railways, tramways, ports, airports
- Management assistance to project owners/clients

Environment and landscape
- Impact (air, water, natural environment, noise)
- Landscaping design

General studies, economic studies and feasibility studies
- Technical, economic and financial feasibility studies of large infrastructure projects
- Transport plans, master plans, urban transport plans
- Traffic modelling and income projections for concession structures
- Socio-economic assessments
- Transport/town planning interaction

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Large transport infrastructures
- Project management: roads, motorways, railways, underground urban railways, tramways, airports
- Management assistance to project owners/clients

Civil works
- Bridges
- Tunnels
- Complex structures

Environment and landscape
- Environmental impact (air, water, natural environment, noise)
- Landscaping design

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Project management, Assistance to Owner
- Alignment, civil works, systems/site, environmental
- High Speed, Intercity and Suburban Railway

General design and management
- Transport plan
- Operation planning
- Signalling brief and studies
- Driving assistance system design
- Public address
- Traffic and revenues studies
- Environmental studies
- Feasibility studies.

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Intelligent transport systems
Intermodal operation and information
Road operation
- Smart traffic management equipment
- Electrical and telecommunications networks
- Traffic management and supervision systems
- Tolls

Public transport
- Crew scheduling, transit vehicles scheduling, vehicle timetables and operations
- Operation support systems
- User information systems.

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Geotechnical engineering
- Engineering geology
- Soil and rock mechanics
- Foundations of buildings and engineering structures
- Excavations and retaining structures
- Earthworks and soil treatment
- Stabilisation of slopes
- Marine and river structures
- Soil-structure interaction
- Soil improvement and reinforcement
- Environmental projects
- Soil dynamics and liquefaction
- Geotechnics software

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Water engineering
- Urban sewage disposal and drainage
- Sewage treatment
- River engineering
- Flood control
- Water supply and transfer
- Drinking water production and treatment
- Coastal engineering, marine environment
- Industrial water
- Underground water, quarries
- Physical measurements
- Impact studies and water-related legislation
- Development of hydraulic and sanitary/hydronic engineering software

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Waste engineering
- Consultancy, feasibility studies
- Multi-system management plans
- Organisation and monitoring of selective waste collection
- Technical, financial and administrative assistance in setting up facilities for waste sorting, composting, incineration and incineration (construction/operation)
- Development of waste management software
- Audit of waste collection services and waste treatment plants
- Technical appraisals, Research & Development

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Management assistance
Design and project management
- Public buildings
- Intelligent office buildings/Offices
- Hotels/Tourist complexes
- Hospitals and laboratories
- Factories/Clean rooms
- Airports and railway stations
- Arts and leisure amenities
- Schools and universities
- Conference and exhibition centres
- Corporate/institutional catering
- Rehabilitation of old and historic buildings
- Housing (new construction & rehabilitation)

Specific studies/design
- Foundations of all types
- Concrete structures
- Metal structures
- Roads and miscellaneous external works
- Electrical installations: high voltage (power and lighting circuits, low voltage communications installations
- Building Management System (Bms)
- Voice Data Image networks (Vdi)
- Heating, Ventilation & Air Conditioning (Hvac)
- Smoke extraction
- Cogeneration/Trigeneration
- Domestic & industrial plumbing
- Lifts, document transport systems
- Maintenance engineering
- Asbestos and lead treatment
- Environmental quality assurance

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Management assistance to management
Design and project management for industrial projects
- Production facilities
- Research and development facilities
- Laboratories
- Clean rooms

Industrial and process engineering
- Facilities needs analysis
- Equipment layout
- Equipment hook-up design and management
- Process and instrumentation diagram (Pid)

Technical review of existing facilities
- Upgrades and expansion
- Technology transfer

Technical assistance and specialised technical studies.

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Quantity surveyors
- Feasibility studies
- Estimation of investment and operating costs
- Preparation of contract documents
- Finalising of contracts and financial schedules
- Litigation management
- Verification of quotes, invoices, interim valuations, estimates, claims
- Agreements and audits.

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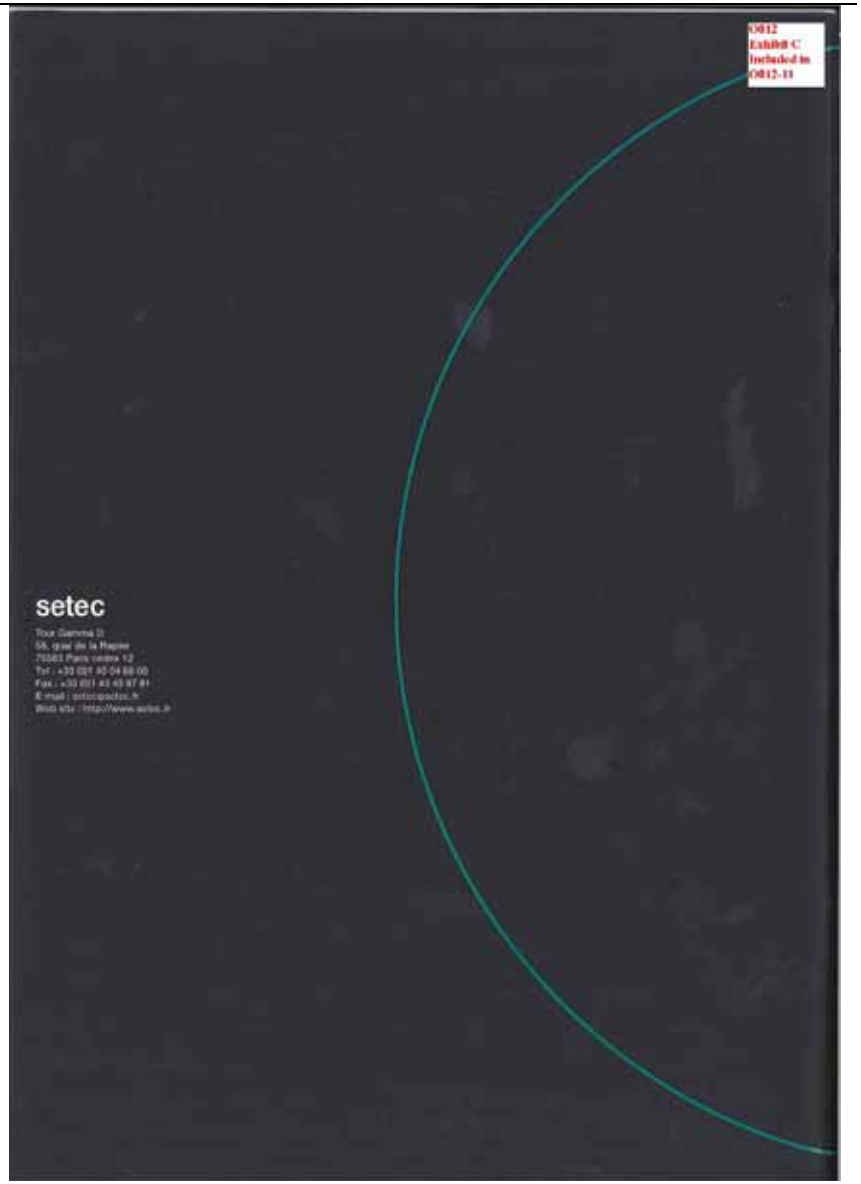
Comment Letter O012 - Continued



Comment Letter O012 - Continued

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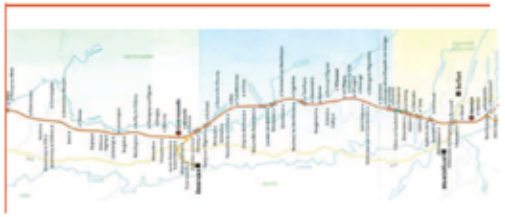
Equipment

O012 Exhibit C Included in O012-11

Rhine-Rhone high speed railway line systems



Client:
RFF

Project manager:
EF2R (SETEC / EGIS RAIL joint venture)

Main features:

- 140 km of double track line on ballast with mono-bloc sleepers
- 43 high-speed track systems as well as safety shunts.
- 140 km of double track overhead contact lines
- 14 signalling centres
- 2 electricity substations to supply the high speed lines with 2 X 25,000 V
- 13 auto-transformer centres
- 27 GSM-R telecommunications centres
- 1 non-electrified maintenance base with 4 maintenance tracks
- 1 temporary works base (17 reception/ training tracks, works train maintenance tracks and tracks for access to storage centres)

The construction of the East Branch Rhine-Rhone high-speed track was declared to be in the public interest in January 2002 and its approval was confirmed by the interministerial planning committee on 18 December 2003.

The first stage of the East branch for which engineering studies are being performed covers a distance of approximately 140 km between Villers les Pots and Petit Croix.

The East Branch Rhine-Rhone high-speed line includes:

- Besançon TGV station,
- Belfort / Montbéliard TGV station,
- Chavanne tunnel (2 km long),
- Albre Trémoins covered cutting (200 m long),
- Four track change-over points located in Thervay, Mondley, Sorans and Les Magny.

Connections to the Dasavey – Besançon Viotte line are planned:

- via the TER tracks in the Besançon TGV station
- on track 2 at km point 57+133,
- on track 1 by two reserved connection points in the Besançon TGV station and at km point 57+133.

SETEC mission:

As part of the general project management for sections A and C, SETEC managed the project for the railway facilities, basing itself on the technical references and scheme designs provided by RFF.

For those purposes, SETEC's missions for the works installation, railway, catenaries, electrical supply and telecommunications systems were as follows:

- project design studies,
- preparation of the consultation documents,
- analysis of bids,
- finalisation of contracts,
- works supervision,
- assistance in handover operations,
- supervision of the first test phases.

An integrated team

To meet RFF requirements, SETEC (sections A and C) and Egis Rail (section B) created the EF2R joint venture company which brought together a team formed from members of the two companies covering all required fields of expertise.
This organisation made it possible to comply with the engineering studies schedule and allowed the railway systems works to begin in a manner that fully complied with the civil engineering works schedule.

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O012 Exhibit C Included in O012-11

LGV Rhin-Rhone Branche Est – 1ere tranche

Infrastructure Owner: RFF

Owner's Consultancy: Inexia

Engineering Companies: Egis Rail

Project stage: Detailed Design and Works

Site: Besançon – Montbéliard – Mulhouse

Period: 2008 - 2011

Mission duties: 47.6 millions €

Investment costs: 1.14 billions €

Main characteristics

GENERAL PRESENTATION OF THE PROJECT:
The Rhin-Rhone project Line is a Y shaped three branches high speed line which is articulated around the city of Dijon. The state approval to the preliminary studies has been published in 2003. The particularity of this project is that for the first time, the final design and the construction surveying for the railroad's equipment has been attributed to a private engineering group after a call for bid (by contrast with previous project, for which the national French Railway Company was the only authority). It's also the first high speed project in France which isn't directly connected to Paris. Its international vocation, with the proximity of the German and Swiss networks can also be noticed. About 12 million additional passengers should be generated each year with those new lines, including an important contribution of foreigner passengers. Those three branches are part of the same global program, but their approval, design and construction are scheduled to be non-simultaneous. The Eastern Branch will be the first to be put into service, especially a 140 km part which will be ended at the end of 2011. This section includes 160 bridges, 12 viaducts and two new stations dedicated to high speed trains.

This 1st section includes 4 junctions with the existing networks, its stations. This supposed important work for modernizing this network. Among the many structures of this project, we can especially underline:
- the station of Belfort-Montbeliard TGV, with an original structure of central building and platforms located between the main lines
- the station of Besancon TGV, which includes a connection to the conventional network
- the viaduct of Tasty, 792m long, which includes a system of following light on the bridge for each train
- the tunnel of Chavanne, single tube tunnel with 2 tracks: it's got a 1970m length and 80m² of section; it's designed for an operating speed of 300 Km/h. (190 Mph)
- the viaduct of Lizaine, 717m long, which passes across a broad valley and over several roads, a river and two pipelines.


Future station of Belfort-Montbeliard


Viaduct of Tasty


Future station of Besancon


Chavonne Tunnel cross section


Viaduct of Lizaine

Comment Letter O012 - Continued

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O012 Exhibit C Included in O012-11

Civil engineering structures

Pertuis viaduct
for Rhine-Rhone LGV high speed railway line

Client:

Réseau Ferré de France (French railways)

Architect :

Cabinet Architecture et Ouvrages d'Art Christophe Chéron & Thomas Lavigne Architects

Project manager:

Setec

Period:

2003 – 2006 Design
2007 – 2008 Construction

Main features:

Length: 220 m
Width: 12.60 m
Maximum span: 55 m
Mixed double girder load-bearing structure

Chosen consortium:

Demathieu & Bard - Eiffel

Cost of works:

48.8 M excl. VAT (2006 value)
Duration of construction: 28 months (including a 250 m long second viaduct with the same features)

The Pertuis viaduct crosses a deep set valley containing the Pertuis stream and the RD 37 minor road. A 220 m long structure was designed as a result of the site's very undulating terrain and the very little latitude available to the designer in following the terrain as closely as possible because of the very slight curvature required to allow TGV high speed trains to travel at up to 350 km/hour.
The piers have a maximum height of 19 metres.
The 12.60 metres wide deck is designed as a mixed double girder construction, with 3.65 m high metal girders and a concrete slab between 0.25 and 0.43 m thick. Bottom lateral bracing is provided by a 15 cm thick concrete slab.
The siting of the piers and abutments was restricted by the crossing over the stream and the road as well as the steep slope on the west side of the valley. A detailed study was conducted to determine the optimal spans in terms of siting of the bearings. As a result of this study, it was decided to have five spans covering a total of 220m (39.50 + 2 x 55.00 +39.50 + 31.00).
Consequently, the structure remains within the range of viaducts that can be launched, and therefore the means to be used can be optimised.
The geotechnical surveys conducted during the design studies found large karstic areas under four of the bearings. Therefore the structure's foundations are 1.80 m diameter piles on the east slope and shallow foundations on the west side.

SETEC TPI mission

Complete project design and construction management, including:

- Definition and follow-up of the preliminary contracts (geotechnical survey),
- Preparation of the detail design then the working design,
- Contractors' tender documents,
- Analysis of contractors' tenders,
- Finalising the contracts,
- Supervision of construction work,
- Approving the working design.

A railway bridge in a karstic area

Due to the large amount of karstic rock discovered, deep foundations were provided for certain bearings, and major soil treatment was also provided under the consolidation blocksand access embankments in order to avoid any settlement or subsidence near the structure.

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O012 Exhibit C Included in O012-11

Civil engineering structures

Viaduct over the River Lizaine
for the Rhine-Rhone LGV high speed railway line

Client:

Réseau Ferré de France (French railways)

Architect:

Cabinet Architecture et Ouvrages d'Art Christophe Chéron & Thomas Lavigne Architects

Project manager:

Setec

Period:

Design: 2003 – 2006
Construction: 2007 – 2009

Main features:

Length: 717 m
Width: 12.60 m
Maximum span: 76 m
Mixed double caisson load-bearing structure

Chosen consortium:

Eiffage TP - Eiffel - Forézienne d'entreprises

Cost of works:

49.5 M excl. VAT (2006 value)
Duration of contract: 34 months (including a 450 m long second caisson beam type viaduct)

The 717m long Lizaine viaduct crosses a wide valley which contains three minor roads (RD 204, RD 438 & RD 316), the two Belfort - Besançon railway lines, a local road, two oil pipe-lines and the Lizaine river.
The siting of the piers and abutments was restricted by the crossings over the minor roads and the railway lines, and also by the aim to not disturb the river's bed and banks.
A detailed study determined the optimal spans for siting the bearings, by recruting only a pipe-line and the RD 316 road. This resulted in 11 spans: 47 m + 55 m + 67 m + 68 m + 69 m + 70 m + 72 m + 74 m + 76 m + 74 m + 45 m, which also met the dynamic criteria for allowing the TGV high-speed train to travel at speeds of up to 350 km/h.
Consequently, the structure remains within the range of viaducts that can be launched, and therefore the means to be used can be optimised. It is on a straight line, with a 21,000 m radius on the longitudinal section.
The 12.60 metres wide deck is designed with a double metal caisson construction, with 3.75 m constant height and a concrete slab of variable thickness (0.25 m to 0.43 m).
The structure's 10 piers are in concrete and of variable height (10 m to around 40 m).
Their architecture is a modern version of the arched form of old railway viaducts.
The bearings are on strip foundations where there are marly calcareous outcrops, otherwise they are on piles.
The viaduct is in an Ib seismic activity area and on an S1 site.

SETEC TPI mission

Complete project design and construction management, including:

- Definition and follow-up of the preliminary contracts (geotechnical survey),
- Preparation of the detail design then the working design,
- Contractors' tender documents,
- Analysis of contractors' tenders,
- Finalising the contracts,
- Supervision of construction work,
- Approving the working design.

A 717 m long railway bridge

The length of the viaduct – 717 m – greatly exceeds the maximum length of 450 m for which track expansion joints are designed. Considering the size of the braking forces and the seismic forces, this requires the use of a functional principle that includes a fixed point composed of two piers (rather than one) and two track expansion joints at the two abutments. The two fixed longitudinal points have fixed pot bearings that take up all loads. The other bearings have longitudinally-sliding bearing mechanisms, one of which is transversally blocked.

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Comment Letter O012 - Continued

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High speed railways

O012 Exhibit C Included in O012-11

Rhine-Rhone high speed line, East branch, Dijon - Mulhouse sections A

Client:
Réseau Ferré de France (RFF)

General project manager
SETEC (sections A & C)

Architects:
Mr. Charon and Mr. Lavigne (AOA)

Periods:
Engineering: 2003-2006
Works: 2006-2009

Main features
Length of sections: 50 km (A) and 36 km (C)
- number of viaducts (up to 800 m long): 7
- number of piers: 3
- number of railway bridges: 44
- number of road bridges: 68
- One 1,970m tunnel (Chavanne)
- One 170 m long covered cutting
- Cuts: 12 Mm3
- Fill: 7 Mm3

Cost of civil engineering works for the two sections: €590 M excl. VAT (2002 values)

The crossing of the Saône valley provided by a 380 m long viaduct and three hydraulic bridges covering a total of 960 m embody the difficulties represented by this line: a large number of natural obstacles and an increasing number of valleys towards the east. As a result, the construction of the line required a large number of civil engineering works (over 120 on sections A and C) and successive rapid passages between deep cut and fill works.

The engineering of the civil engineering works was carried out by Setec TPI, which placed the architectural design in the hands of the AOA practice. As the high-speed line was located in a rural site, the architects wanted a certain restraint in the expression of the high speed line sought by RFF. As a result, identical shapes of piers, types of facings and equipment details were used over the entire length of the line. However, these elements were handled in a different manner for the section between Dijon and Belfort.

The technical design of the viaducts – some just above ground level, like the Saône viaduct, and some of a great height, such as the Lizaine viaduct that passes 60 metres above the bottom of the valley – made use of spans which, while long, were not exceptional (from 45 to 76 m) in order to obtain the best compromise in the site-construction of works balance. The decks of these viaducts are either steel double girders or double box girders with a reinforced concrete slab.

Concerning the "standard" works, although designed to be as restrained as possible, many reveal a level of subtlety that was not initially planned.

The crossing of the Chavanne hill required the construction of a 130 m2 section tunnel excavated and bored over a distance of 1,730 m through a geological structure combining potentially karstic limestone and soft swelling marl.

SETEC mission

Setec provided the general civil engineering studies and works project management for two of the three high speed line sections, representing 85 km.

The mission particularly included:
- data acquisition (geotechnical, hydraulic, surveys, land use),
- the preparation of technical construction files for the railway working platform and the restoration of communications,
- consultations with contractors,
- works supervision.

It should also be noted that, in partnership with Egis, Setec provides the project management for railway facilities (EF2H joint venture).

Karst

The line crosses a large number of sites initially identified as potentially being karstic. This subsequently proved to be case. To increase the reliability of the design and of the subsequent construction of the works, Setec defined and managed a major soil survey from the initial design phase. This led to a clear understanding of the risks and problems to be integrated into the works contracts. During the works, a supervision unit was set up to monitor new surveys and finalise the treatments to be adopted; its reactivity meant that at no point did the problems related to the karstic nature of the soil jeopardise the general work schedule.

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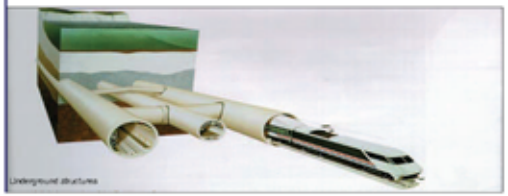
Underground Structures

O012 Exhibit C Included in O012-11

The Channel Tunnel



Client:
Eurotunnel

Project manager:
Setec – Atkins group.
Eurotunnel, Project Implementation Division (a team mainly comprised of SETEC-ATKINS staff, assigned to Eurotunnel).

Construction firms:
Trans Manche Link (a consortium of 10 major companies: 5 French, 5 British).

Dates:
1986-1994.

Main characteristics:
3 x 50.5 km parallel tunnels (2 rail tunnels with internal diameter of 7.6m and a service tunnel with internal diameter of 4.8m)
Cross-passages that link the tunnels at 375m intervals.
Pressure relief ducts (PRDs) spaced every 250m.
Two underground crossovers.
Numerous instrument stations.
Two loop track terminals.
Sophisticated equipment.
Highly innovative rail shuttles for road vehicles.
Project cost: FRF 50 billion (1985 value).


Letter from the Chairman of Eurotunnel to Setec, January 1991

The Channel Tunnel was built using 11 tunnel boring machines (TBMs) drilling through chalk marl. The rate of progress exceeded 1,000m per month. The tunnel can accommodate traditional trainsets (passenger/ freight) and shuttles carrying road vehicles (vans and cars, coaches, caravans and HGVs). The vehicles embark in the terminals. The installations are operated using highly sophisticated equipment which also means users enjoy a high level of service.

SETEC TPI's remit:

- Within Eurotunnel (until the end of 1994):
  - oversight of design and detailed studies,
  - supervision of work and trials,
  - control of costs, timescales and quality,
  - general technical support.
- Independent Project Manager on behalf of the Governments and Banks:
  - assessment of preliminary designs and their Concession compliance,
  - monitoring of construction conformity with preliminary designs,
  - attending acceptance tests and commissioning,
  - scrutiny of operating regulations and security system,
  - monitoring of costs, timescales and any contractual problemsis,
  - monitoring the application of the quality control system.


French terminal

An exceptional binational achievement.

This is an innovative, exceptional project, with Setec playing a central role in every aspect since 1957. The 1986 project, commissioned in 1994, follows on from Setec's preliminary work in 1971-1975.


Tunnel gallery

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Comment Letter O012 - Continued

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O012 Exhibit C Included in O012-11

Underground structures

Rhine-Rhône high-speed line – Eastern section - Chavanne Tunnel

Client:

Réseau Ferré de France – Rhine-Rhône High-speed line – Eastern section

Project manager:

SETEC

Dates:

Detailed preliminary design: Sept. 2003 - June 2004

PROJECT: Sept. 2003 – June 2005

Bidding documents: June 2005 - November 2005

Invitation to tender: December 2005 – February 2006

Main characteristics:

Monotube with 2 tracks side by side.
Length: 1,970 m.
Air draught: 100 m².
Incline: 2.6% maximum.
Longitudinal fire main.
Excavated with explosives or by digger.

Project cost: €80 million + VAT.

The Chavanne Tunnel enables two tracks on the high-speed line to traverse the highest point in their journey via a unique bore. Its 100 m² useable section, representing around 160 m² of excavation allows TGV trains to pass through at 350 kph.

Interministerial Technical instruction No 98300 on rail tunnel safety was taken fully into account from the start of the design process: for example, there is a built-in fire system incorporating a raised reservoir with 3 x 60 m³ compartments and a longitudinal main with hydrants every 250m, the incorporation of which into the tunnel passages was a challenge because of their space requirement.

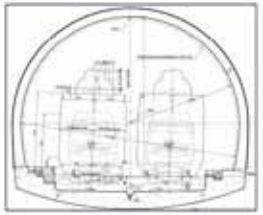
Measuring 1,970 m in length, the tunnel is located near an area of outstanding natural beauty which called for extensive precautions to protect the natural environment during the work.

The terrain encountered was mediocre, being comprised largely of Toarcian mudrock including some parts that have potential for significant swelling when wet.

This therefore necessitated special measures during the excavation process itself plus modification of the lining by increasing its thickness, or even by accentuating the curve of the bottom slab of the tunnel, achieving the sought dimensioning through finite element analysis calculation.

SETEC TPI's remit

- Design project manager:
  - Development of the detailed preliminary design and Project documentation.
  - Supplementary Project Management support tasks.
  - Project management of the supplementary geotechnical surveys (design and build).
- Build project management:
  - Drafting the bidding documents for 90 km of high-speed line including the tunnel
  - Monitoring of the work.



Large-scale ground surveys

Initial geotechnical runs based on probes taken from the surface revealed the complexity of the ground underneath, which ranged from bituminous schists on the western head to the mudrock found deeper. This is why Setec suggested carrying out geotechnical surveys on a larger scale and drew up two contracts, one to cut a test trench 8 m in depth and 40 m long aimed at validating the slopes of the embankment of the access trench at the face (200,000 m³) and the other to dig a shaft 35 m deep and a 20 m tunnel on the site of the future tunnel. These sites were completed for the launch of the tender.

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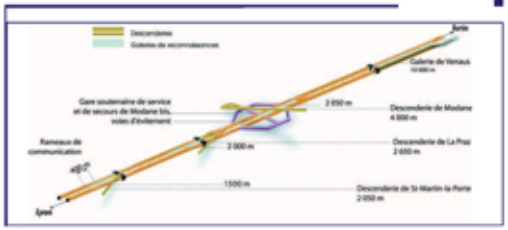
O012 Exhibit C Included in O012-11

Underground structures

The Lyon-Turin rail link



Project owner:

Lyon Turin Ferroviaire (joint subsidiary of RFF and RFI)

Main contractor for construction surveys:

International engineering grouping (agreed representative: Setec TPI)

Years:

Summary preliminary project design: 2002-2003
Reference preliminary project design: 2004-2006

Main features:

New 70km section of line comprising:
- a 52km tunnel
- a 1km viaduct
- a 12km tunnel

Total estimated cost: €6 billion

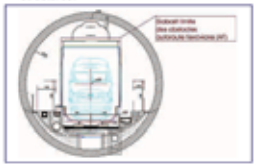
As the common portion of the international section of the new Lyon – Turin rail link, the project involves 70km of line in all, and includes a main tunnel 52km long, a 1km viaduct and a second 12km tunnel.

It is intended to take annual freight traffic estimated at a total of 50 million metric tons, which involves in particular the carrying of 1.2 million of heavy goods vehicles with and without drivers (the so-called "Rail Highway" system) between two terminals, one in the Lyon area and the other in the Piedmont. It also provides a link for high speed train passengers (travelling at a nominal 220kph) between the two countries.

The tunnels are of twin-bore construction with an interior diameter of 8.4m connected by cross-passages every 400m. The 52km-long Base Tunnel is also equipped with comprehensive safety systems: a security and emergency passenger evacuation post, located at the tunnel's midpoint and, regularly spaced along it, four intervention facilities for dealing with freight trains on fire. These structures are connected to tunnels leading out to the open air with lengths of between 2km and 10km.

SETEC TPI's missions

1. In the preliminary project design phase (2002 – 2003) :
   - SETEC was the agreed representative of an international engineering grouping responsible for all studies on technical aspects, rail operation and safety & security for the preliminary project design.
   - SETEC conducted goods traffic studies incorporating a specific model for the Rail Highway and supplying elements for analysis of project economics flowing from this.
   - SETEC, in a grouping with the engineering companies previously responsible for the operational studies, carried out a preliminary survey on the organisation of the terminals of the Rail Highway system.
2. In the reference preliminary project design, a phase due to occupy the period 2004 to 2006, SETEC has taken on the task of overall coordination of the international engineering grouping which is beginning the studies on system operation, maintenance and safety & security and to which LTF will also be entrusting the execution of technical studies for the civil engineering and infrastructures.



Major contributions to key project aspects

SETEC made a major contribution to the safety studies-smoke control system, emergency and evacuation procedures – as well as to the studies to determine the methods for civil engineering work, with a focus on the optimisation of lead times and costs.

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fax.01.43.46.89.95
internet tpi@tpi.setec.fr

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Underground structures

CDG Express

Project Owner:

EIG CDG Express (grouping ADP, RFF, SNCF)

Years:

2001-2002

Main features:

Single-tube rail tunnel 10km in length, 9m internal diameter, shallow depth.

The project involves the provision of a dedicated rail service between Paris and Roissy Charles de Gaulle airport offering a journey time of less than 20 minutes with four trains per hour over a very large part of every day of the year.

The core solution involves defining the route taken by the CDG Express (between the Gare de l'Est and the TGV high speed train station at Charles de Gaulle airport) to make partial use of the existing infrastructures (between Paris and Noisy-le-Sec and the point of arrival of the line at Roissy station) and requires the creation of some 14km of new track, 10.8km of which would run through a tunnel.

Following the Public Debate initiated by the National commission for public debate in 2003, the CDG Express Economic Interest Grouping undertook to look at possible alternatives. The aim continues to be to start up construction in 2007 with the aim of commissioning the service in 2012.

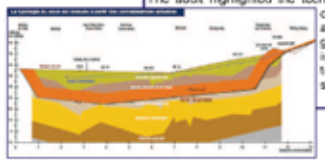
The Mission of SETEC TPI

Before the holding of the Public Debate, the EIG CDG Express wished to have carried out by Setec an independent technical audit of the project for the construction of the new infrastructures for the core solution which the EIG has taken forward to the preliminary project design stage.
The audit entrusted to Setec, performed in 2001 – 2002, involved the following:

- Statement of an opinion on the technical difficulties of construction of the 10.8km tunnel and their consequences in terms of duration of construction and lead time to completion. On this occasion Setec gave an opinion on the tunnel safety systems, on its route in terms of plan and profile, and on the advantages and disadvantages compared with a single-tube solution (the core solution) and a twin-tube solution in terms of rail operation, safety and construction;
- Statement of an opinion also on the technical difficulties of the structures planned for the point of arrival at Roissy station, underpasses under runways and taxiways and integration into existing structures.

The strenghts of the audit

The audit highlighted the technical difficulties involved in the civil engineering work for what is a long tunnel in the prevailing geological context and for the integration of the safety constraints into the design of the structure.



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Appendix E: Individual CVs

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Curriculum Vitae

Update : March 2010 *Page 1 to 3*

Philippe VOIGNIER

date of birth	25th of september 1953
nationality	French
education	Certified Project Manager AFITEP (IPMA) in 1997
	Civil engineer from l'Ecole Nationale des Ponts et Chaussées (1975)
languages	English
	German
position	General manager

Key record

After over 30 years spent on railway engineering in Société Nationale des Chemins de fer Français (SNCF), the French national railway company, Philippe Voignier joined SETEC Group where he is general manager of SETEC Ferroviaire.

setec ferroviaire

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Curriculum Vitae – Philippe VOIGNIER

Update : march 2010 *Page 2 to 3*

Since october 2008	**General manager of Setec ferroviaire**
	Setec ferroviaire is the SETEC Group company specialized in railway engineering : operation, systemwide, maintenance.
February to september 2008	**SNCF International**
	Project director of Casablanca Tanger HSR new line in Marocco
January 2007 to february 2008	**INEXIA** **Deputy general manager**
	INEXIA is a subsidiary of SNCF Group, created in 2007 and specialized in railway engineering : socio economic studies, operation, civil works, systemwide, environmental studies, maintenance.
	INEXIA delivered detailed design, works survey, testing and commissioning of the East European High Speed Line (World Speed record at 360 mph).
	SNCF Engineering, Project Department
2004 to 2006	**General manager**
1999 to2004	**Deputy general manager**
	The Project Department delivered socio economic studies, environmental studies, operation and maintenance studies, technical expertise, design, survey, testing and commissioning of various railway projects, including HSR and local lines.
	The Project Department was RFF (Réseau ferré de France « RFF » is the owner of French national railway network) technical adviser for the East European HSR and for the Rhin – Rhône HSR line.
	The Project Department became INEXIA in 2007.
1997 to 1999	**SNCF Technical Head of East European HSR project**
	Preliminary design
	Organization setup for detailed design, real estate and works
1989 to 1997	**SNCF Infrastructure** **Manager of various technical engineering departments**
	Involvement in European Standards
1986 to 1989	**SNCF PARIS-MONTPARNASSE station**
	Head of the preliminary and detailed design, survey, testing and commissioning of the renewed station in Paris for the operation of the new High Speed Line « LGV Atlantique » to the west and south west of France.

Comment Letter O012 - Continued

setec ferroviaire

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Curriculum Vitae – Philippe VOIGNIER

Update : march 2010 *Page 3 to 3*

1979 to 1986	**SNCF « LGV Atlantique » high speed line** Head of the preliminary and detailed design of bridges, viaducts, cut and cover
1976 to 1979	**SNCF « LGV Paris –Lyon » high speed line** Engineer for preliminary and detailed design of bridges, viaducts, cut and cover

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Jean-Pierre PASZKO

Current adress: Lot "Les brochets" 71210 Saint Laurent d'Andenay France	☎ +33(0)3-85-78-00-85 (Home) ☎ +44 7 795 643 866 (Mobile) E-Mail :jppaszko@ctrl.co.uk

Date of birth : **31st of May 1948**
Nationality : French
Married, 2 childrens

Systemwide Construction Expert

Educational Background

Degrees in Physics and Chemistry , University of Burgundy, 1967/1970
Master of Chemistry degrees, University of Burgundy, Dijon 1971
Certificate in Solid Materials & Metallurgy: Conservatoire National des Arts et Métiers 1972

Work Experience : Engineering and Construction

Dec 2009 up to now: SETEC Ferroviaire: Technical Director

As Technical Director of the Ferro Branch, in charge of the follow up of all High Speed Projects in which the Company is involved:

- The construction of the new extension in East of France of the South-East HSL, connecting Dijon and Mulhouse, a link in 130 Kms length for a design speed of 350 Kmh to be commissioned in December 2011.
- Projects under review: SEA; connection between Tours and Bordeaux (350 Kms), extension of the East European HSL by a link of 110 kms Metz to Strasbourg including a tunnel in 4 kms length; By-pass Nimes to Montpellier; connection by 70kms of mixed traffic lineHSL(300Kmh and Freight), extension of the Atlantic HSL;120 Kms link between LeMans and Rennes.

April 2008- December 2009: Marmaray Projet/ALSTOM Company.

As Construction Manager and Operational Manager, leading for Alstom the Construction team covering a consortium of Alstom, Dogus and Marubeni.,
In charge of the design and the beginning of the refurbishment of Asian line(40Kms) European line (25kms) and the systemwide equipment inside newly built Tunnel underneath Bosphorus 8;5 km in Asia, 4.5 km in Europe and 1.3 km immersed tunnel.
This Project includes also 3 new depots for new rolling Stock.
The whole Project was designed inside Istanbul and suburbs in Turkey, still under construction.

September 2006 to April 2008:
As Contract Manager for Bechtel Company, leading of 8 contracts for the immunisation of the new HSL CTRL 2, 40 Kms length including double tubes tunnels underneath Thames river and London up to St-Pancras Station for a total of 40Kms of tunnels section operated at 230Kmh. Close all the CTRL 2 systemwide contracts from June 2008 to November 2008 as Contract's Manager under the authority of the RLE Director.

Comment Letter O012 - Continued

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In charge of the final commissioning CRTL 2 line and the Eurostar Depot in Temple Mills, and after the transfer to the Operator in November 2008, stay as technical advisor for the Guaranty period (last manager to stay).
Part time on the Crossrail Project as systemwide Construction Manager for the preparation of the bid documentation and the development of the overall programme.
This Project is a major Project underneath London with a Central section of 40 Kms of tunnels and 13 interconnection stations with the existing Tube under operation. (completion expected for 2019)

2003-2006

- **Systemwide Construction Manager RLE/CTRL Section 2**
- Management on site of an Engineering team of 24 field engineers covering the installation of ballasted on open route and concreted track inside tunnels, catenary and M&E equipment.

2002-2003:

- **Systemwide Construction Manager RLE/CTRL Section 1**
- Management of the Construction team on site for ballasted track, turnouts installation , M&E equipment
- Testing –Commissioning of the Section 1 as support of the Commissioning Manager

2000-2002:RLE/CTRL Section 1

- **Interface Coordinator Systemwide;**
- Responsible for the coordination of all Systemwide Activities on CTRL Section 1
- covering the interfaces with Civils and Utilities diversions, connections with live Railways
- Coordination of Systemwide Activities including Signalling, M&E, Controls & Communications, Radios
- Integrated programme of Construction
- Documentation from Contractors for Construction Method Statements, work Plan, Construction Plan, Quality Plan

1998-2000:

- **Track expert: RLE/CTRL**
- In charge of Feasability studies,
- Construction Methods and Specifications
- Construction Standards
- General Programme of Construction for Systemwide
- Tender documentation for Track & Catenary Contract

1998: Systra Pole Engineering

- Cairo: Expertise of a turnout's Construction site and recommendations for a Refurbishment Plan

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- Taiwan: High Speed Project (THRSC): Preparation and Presentation to the Client of the Maintenance Plan and Policy

1996-1998: RLE/ CRTL

- **Design and Construction Expert, Track Manager**
- In support of the Construction Manager, preparation of the Systemwide construction Programme.
- Preparation of all the Construction Specifications & Standards for track activities
- Preparation of the tender documentation

Work Experience :High Speed Tracks Construction &Maintenance

1992-1996 : SNCF Paris Sud -Est

- **Deputy Manager of a Maintenance Unit (225 Kms of High speed track)**
  - ✓ As Deputy Manager, in charge of all the production and implementation of modernisation works
  - ✓ Safety Manager and management of the staff (250 units of labour and engineers) including the Training Plan
  - ✓ Management on daily basis of the Maintenance Contractors

1992 : SNCF Lyon/St Quentin-Fallavier

- **Deputy Manager of a new Maintenance unit**
  - ✓ Creation of the Maintenance Unit for the HST extension (104 Kms of Tracks, Catenary and Systems including Satolas Airport Station
  - ✓ That covers all the Maintenance Plan, the Equipment and Plant purchase, labour and supervision recruitment

1988-1992 :(High Speed Lines extension in Lyon)

- **Track Construction Manager (104 kms of lines)**
  - ✓ Track Construction Management of the Contractors on daily basis
  - ✓ That includes track and turnouts Construction

1984-1988:Track Maintenance Inspector at the SNCF Head Office

- In Charge of all the Specifications for track maintenance for High Speed Lines
- That Covers: South East HSL operated, Atlantic HSL under construction, North Line in projet
- Contact point between the SNCF Head-Quarter and Construction and Maintenance units

1978-1984:

- Field Engineer in charge of Civils Construction and Systemwide installation inside the Construction Team of the 1st HSL in France (225 Kms of Lines)

Languages

- French : Mother tongue
- English : fluent , 10 years in UK
- Polish : Spoken and writing

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Computer skills

- Office automation:
  - ✓ Word, Powerpoint, Excel, advanced user
- Databases
  - ✓ Prima Vera planning

Voluntary activities

Sports and hobbies

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Jean Bernard Updated June 2009

Year of birth	1953
Nationality	French
Passport	Passport number: 07 CH 66076 Date of expiry: 2017, September 12th
Education	Graduate from Ecole Nationale des Ponts et Chaussées – Civil Engineering
Foreign languages	English, German
Joined setec in	1975
Position	Director
Main teaching experience	1976 – 1994 : Ecole Nationale des Ponts et Chaussées - Professor in Material strength and reinforced Concrete

Professional experience

Jean Bernard's field of activity is civil engineering structures, especially bridges and underground structures. His experience includes preliminary design, structural design, construction design for structures and project coordination, as well as the management of major multi-disciplinary projects.

Jean Bernard usually works as Project Director on large scale infrastructure projects such as intercity express ways or high speed railways lines.

Main references

Since 1975	**Setec travaux publics et industriels**
	RAIL PROJECTS
In progress	**High speed railway line between Dijon and Mulhouse (France)** Project director for Section C, stage 2: Detailed design and works supervision: - 35 km railway line, - 8 km viaduct, - 3 km standard bridges
2008	**High Speed Railway line Provence-Alpes-Côte-D'Azur (France)** Assessment of functional and structural capacity for 100 tunnels along the various high-speed routes being studied, as regards to the new regulations for rail tunnel safety
2008 - 2009	**High speed railway line between Paris and Strasbourg (France) – Section H – 35 km** Director of Saverne tunnel project and civil engineering structures Updating of Project established in 2001 (see description below) according to new seismic regulations and new safety regulations for rail tunnels: the Saverne tunnel is a bi-tube tunnel with a 52 m² section.

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Mel: tpi@tpi.setec.fr

Comment Letter O012 - Continued

curriculum vitae Jean Bernard (cont'd)

Updated June 2009

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2004 - 2009

High speed railway line between Dijon and Mulhouse (France)

Project Director for Section C, stage 1: preliminary design, detailed design, preparation of tender documents and management of civil engineering works, for 30 km of new line and:

- Chavanne tunnel (1,970 m long; 80 m² section)
- 6 rail viaducts from 220 m to 716 m long
- 30 standard civil engineering structures
-

2002 - 2003

High speed railway line between Lyon (France) and Turin (Italy) - Saint-Jean-de-Maurienne (F) - Bruzolo (I) Section

Responsible for "Civil Engineering" design: technical development, safety and operation design of the 72 km long central section, including the main tunnel (53 km long) under the Alps and the Bruzolo tunnel (12 km long)

2002 - 2003

High speed railway line between Perpignan (France) and Figueras (Spain)

Project Director for Preliminary design of Perthus tunnel (8.4 km long) under the Pyrénées, 6 rail viaducts and 35 standard structures.

2001 - 2000

High speed railway line between Paris and Strasbourg (France) - Section H

Project Director for the detailed design of Saverne tunnel (4,019 m long; section: 100 m²), 6 rail viaducts and 33 standard structures

PROJECT COORDINATION AND DESIGN FOR ROAD AND HIGHWAY PROJECTS

In progress

Tunnel Prado Sud in Marseille (France)

Design and integrated coordination for a 1.4 km long cut and cover with 2x2 stacked lanes

1999 - 2000

Kenodo in Japan

Project Director for the preliminary design of a 17 km section of the highway project, including 9.5 km of standard section viaduct and the bridge for crossing the Tonegawa River (length of 1335 m), for which various spans (maximum span of 260 m) and deck structures were analyzed.

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curriculum vitae Jean Bernard (cont'd)

Updated June 2009

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1999 - 2000

A43 Maurienne Highway (France) – 33 km

Project Director for civil engineering structures and tunnels for the construction of the A43 highway:

- 23 viaducts (71,000 m² of deck + 3 canal aqueducts)
- 40 standard civil engineering structures (15,000 m² of deck)
- Two 3-lane tunnels:
  - Orelle tunnel: 3,680 m long, with partial transversal ventilation
  - Sorderettes tunnel: 400 m long
- 40,000 m² of supporting structures
-

1989 - 1990

Puymorens Tunnel (France)

Project Director for the detailed design of the tunnel: 4,820 m long road tunnel on the Toulouse – Barcelona route

BUILDING STUDIES

1990

Clean rooms of the "Grenoble 92" (France) project of SGS-Thomson

Design of structures to meet very strict vibratory criteria for the process support floor, characterized by a velocity $V_{RMS} \leq 3\mu m/s$

World record at the time

Adjustment of a digital model for schematization of buildings with in-situ measurements

1977 - 1978

Study of seismic behavior of 900 MW nuclear power plants

Seismic preliminary design of 1300 MW nuclear power plants for EDF

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curriculum vitae Jean Bernard (cont'd) Updated June 2009

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	CIVIL ENGINEERING STRUCTURE STUDIES
1990 - 1991	**High speed railway line between Paris and Lille (France)** OA 15 and OA 16 bridges on the Deule river in Lille: railway bridge with lateral metal girders, with a total length of 580 m. Construction design of the structural steel work with, in particular, an analysis of the dynamic behavior of the deck with the passing of the high speed train
1987 - 1988	**Cheviré Bridge on the Loire river (France)** South viaduct of prestressed concrete (797.80 m long + 162 m isostatic metallic span) and North viaduct of prestressed concrete (602.80 m long) Control and approval of construction documents for the concrete structures
1983 - 1984	**A86 highway – Crossing of the PLM line (france)** Control and approval of construction design and technical assistance to Project Coordinator (DDE of the Val de Marne) for the construction of structures for crossing rail lines, 4 mixed decks (concrete top slab on metal girders) of a length of about 200 m
1979/1982	**Lille Metro - Line n°1** Tender documents and control and approval of construction design for viaducts (lengths: 1,225 m and 1,450 m) intended to carry line n°1 of the Lille metro (Lille Urban Community): prestressed concrete deck (spans between 23 m and 45 m) cast in place on advancing scaffolding. Deep foundation work in old quarries.

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PERSONNAL DETAILS

Name : LEGENDRE

First Name : Michel

Home address : 21 rue du haut pâtis 35890 Laillé (France)

Phone number : 06.70. 27.73.55 (mobile phone) / 02.99.42.31.35 (office)

Date of birth : 03/03/1947

Education : SNCF 's Apprenticeship school A. Piron (Le Mans /France)

Languages : Conversational italian /

PRESENT PROFESSIONAL STATUS

Freelance engineering consultant

WORK EXPERIENCE

Since 2002 Freelance engineering consultant LEGENDRE CONSEIL FERROVIAIRE

1998 / 2002 Réseau Ferré de France (RFF) – Head office
Responsible for Running department

1993/1998 SNCF (French Railways) - Région Transport Division of Paris Nord
Head of the studies division

1991/1993 SNCF - Région Equipement Division of Paris Nord
Head of DV 21

1988/1991 SNCF- Exploitation Etablissement of Paris Banlieue Saint-Lazare
Replacement of the Establishment head

1985/1988 SNCF - Exploitation Etablissement of Paris Saint-Lazare
Stationmaster of Paris Saint-Lazare.

1980/1985 SNCF - Région Transport Division of Paris Saint-Lazare
Assistant of the Division head for the training of the Transport master agents and future managers

1978/1980 SNCF - **Exploitation Establishment of Paris Saint-Lazare**
Assistant of the Establishment head for security and exploitation postes

Comment Letter O012 - Continued

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1974/1978 SNCF - **Equipement Division of Paris Montparnasse**
Definition and elaboration of signalling programs.

1969/1974 **SNCF - Posting to the Region working service of Le Mans.**

1965/1969 ***SNCF* - Skilled worker in the workshops and depots of Le Mans (France).**
1962/1965 **SNCF On going education : apprenticeship school A. Piron (Le Mans /France)**

1962 **Entering into the French Railways (SNCF) as Material and Traction's apprentice**

SUMMARY OF ACCOMPLISHMENTS

Since 2002 **Freelance engineering consultant LEGENDRE CONSEIL FERROVIAIRE**

Running assessment, analysis and dynamic transport modelling of future passenger rail link Pretoria-Johannesburg and Sandton- Airport (South Africa)

High-level running assessment of the Trans-Gabonese for new traffic' intake

Support for the Algerian government Transport Office in the frame of the 2005-2009 national transport plan (whole Algeria, Alger suburb and north ring road Oran Annaba

Assessment of Nice's station capacity

Study of the Dijon's rail junction related to West and East branches of TGV Rhin Rhône. Analysis of new junctions and facilities of east area of Dijon

Running study of the new rail link Lyon Turin

O012 Exhibit C Included in O012-11

Achievement of the rail installations guiding pattern of the Nantes' complex.

Guide. Thesis related to rail running achieved by student of Valenciennes University

Supervisor. In the frame of Master of Transport – ICAM engineering school

Teacher, as rail expert . Ecole nationale des Ponts et Chaussées

Running analysis of the new 250km long railway (passenger/freight) of the Botnialine (north of Stockholm , Sweden)

1998 / 2002 **Réseau Ferré de France**
Direction du Réseau Ferré

Head of running department

Achievements of running and capacity studies for new railways:

TGV Rhin Rhône south branch, Nîmes Montpellier bypass, Montpellier Perpignan rail link, Lyon bypass

Achievement of many important french rail complexes guiding patterns : Rennes, Toulouse, Bordeaux, Rouen, Tours St Pierre des Corps, Perpignan ; Nancy (East TGV). International development in the frame of Perpignan Figueras link.

Development, in collaboration with Corys and Valenciennes University, of a tool allowing timetables and rail installations design and modelling transport.

1993/1998 **SNCF -**
Division du Transport Région de Paris Nord

Comment Letter O012 - Continued

O012 Exhibit C Included in O012-11

Head of studies' department. Achievement of suburban passenger transport plan, running and facilities assessments. Special achievement : transport plan for every events within the "Stade de France" (including 1998 world soccer cup)

1991/1993 **Division de l'Equipement Région de Paris Nord**

Head of DV 21 , organization in charge of projects regarging facilities, runnig and signalling

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1988/1991 **Etablissement Exploitation de Paris Banlieue Saint-Lazare**
Remplaçant du chef d'Etablissement avec les fonctions gestion, organisation et personnel.

1985/1988 **Etablissement Exploitation de Paris Saint-Lazare**
Chef de gare de Paris Saint-Lazare.

1980/1985 **Division du Transport Région de Paris Saint-Lazare**
Etudes horaires et infrastructures.
Assistant du chef de la division pour la formation des agents Transport maîtrise et futur cadre.

1978/1980 **Etablissement Exploitation de Paris Banlieue Saint-Lazare**
Adjoint au chef d'Etablissement pour les fonctions sécurité et exploitation.

1974/1978 **Division de l'Equipement de Paris Montparnasse**
Définition et élaboration des programmes de signalisation.

1969/1974 **Affectation au service de l'Exploitation Région du Mans.**
Emploi dans les gares – Fonction circulation, sécurité et commerciale.
Instructeur à l'école exploitation de Viroflay (2 ans).

1965/1969 **Ouvrier aux ateliers et dépôt du Mans**

1962/1965 **Ecole d'apprentissage A. Piron Le Mans.**

1962 **Entrée à la SNCF comme apprenti Matériel et Traction.**

Comment Letter O012 - Continued

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curriculum vitae

Updated : October 2007

Sylvie SOUCHON

date of birth	1962
nationality	French
education	Doctorate in Geography from the Scientific, Technical and Medical University in Grenoble 1990. PhD. equivalent in Physical Geography from the Geographical Institute of Aix-Marseille II University, 1985. Masters degree in Geography from the Geographical Institute of Aix-Marseille II University, 1984.
languages	English, Spanish
position	Senior engineer, head of Environment and Landscape department

Key record

After several years spent on high-level research, S. Souchon joined the « Environment and landscape » department of SETEC International where she carries out environmental studies and manages the Department. This involves coordinating the teams, supervising impact studies, public enquiry documents (state approval, water legislation) and socio-economic studies, and leading environmental studies of various kinds (preliminary investigations, impact studies, engineering consultancy for motorways) in France and occasionally abroad.

Since 1991 — **Setec International**

ENVIRONMENTAL AND IMPACT STUDIES FOR LARGE-SCALE PROJECTS

Since 2010

- **Hight Speed Railway between Toulouse and Narbonne (150 km)**
  Head of the Environment part of the preliminary studies, including comparative and environmental analysis of alternatives.

Since 2009

- **GPSO (Hight Speed new line of railway in South Western of France) between Bordeaux – Toulouse and Bordeaux – Spanish border (450 km)**
  Head of Environment and Sustainable Development for the general assistance to the owner RFF, during preliminary studies, comparative analysis of alternatives and Environmental Impact Assessment.

2008-2009

- **LGV EST Européenne (East European high-speed railway), Section H – Danne et Quatre-Vents - Vendenheim (35 km)**

Head of the external control of regulation procedures : public inquiry documents, alignment with local urbanisation plans, under the terms of the environmental code (Water law), applications to the *Conseil national de la protection de la nature*.

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13127 Vitrolles
Tél : 33-04 42 89 92 72 - Fax :33-04 42 89 56 40
Mel : setecinter-vit@setec.fr

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curriculum vitae : Sylvie SOUCHON (cont'd)

- **Public Private Partnership bid for the Sud Europe Atlantique high-speed railway between Tours and Bordeaux (300km)**
  Head of the Environment and Sustainable Development part of the technical consultancy : co-ordination of participants and control of the studies and deliverables.

2007

- **Philharmonie de Paris in la Villette**
  In charge of the impact study for planning permission of the future grand auditorium

1997 to 2007 — **FRANCE**

- **A89 West Bordeaux to Brive motorway.**

Head of Environment for the general engineering consultancy for the Mussidan-Villac section (70 km).
Water legislation procedures for the Mussidan-Villac section.
Head of environmental studies for the preliminary design of the whole section.

2004-2006

- **Consultancy for the environment and landscape study for the eastern branch of the Rhin-Rhône high-speed railway Dijon – Mulhouse, sections A and C, 95 km**
  In charge of external control for the environmental work.

2005

- **Bid for the concession of the Langon – Pau motorway**
  Coordination and control of the studies relating to the environment and water law procedures.

2005-2006

- **A89 motorway West Bordeaux - Brive**
  Head of the intermediate environmental impact assessment for the Mussidan - Périgueux East (33 km) and Périgueux East – Thenon (33 km) sections.

2004

- **A89 motorway West Bordeaux - Brive**
  Production of the public enquiry documents for the modified state approval procedure for the A89 motorway between Peyrignac and Cublac (6 km).

2001 – 2003

- **Languedoc Roussillon high-speed railway – New line bypassing Nîmes and Montpellier**
  Assistance to the owner RFF in preparing the specifications and supervision of the environmental impact assessment for the state approval procedure.

2000-2001

- **Public transport services to the south-eastern sector of Nantes**
  Head of environmental studies for a public transport service for the south-eastern sector of Nantes (Tram line 3 South 3.5 km, dedicated bus lane, redevelopment of the A801 (southern radial road) (Preliminary studies, Environmental impact assessment, state approval and water law procedures)).

1999-2000 — **POLAND**

- **A2 motorway bypass of Warsaw (Berlin-Moscow link).**

Head of environmental studies, carried out in liaison with Polish sub-contractors, which included the following phases :

- alignment investigations with comparative analysis of alternatives,
- impact study with comparative analysis of alternatives,
- impact study for the suggested alternatives,
- preparation of public enquiry documents and follow-up of consultations with authorities.

5, chemin des Gorges de Cabriès
13127 Vitrolles
Tél : 33-04 42 89 92 72 - Fax : 33-04 42 89 56 40
Mel : setecinter-vit@setec.fr

Comment Letter O012 - Continued

O012 Exhibit C Included in O012-11

curriculum vitae : Sylvie SOUCHON (cont'd)

1999 — **FRANCE**

- **Baussengue Canal crossing in Martigues (Bouches du Rhône).**

In charge of assessing the impact of a double bridge project over the Baussengue Canal to link the Etang de Berre (a lagoon) to the Gulf of Fos

1998 — **FRANCE**

- **A87 Angers - La Roche-sur-Yon motorway - Mortagne sur Sèvre - La Roche-sur-Yon section (50 km in the Vendée).**

Application for authorisation under the terms of the Water Law.
In charge of producing the report on project impact and compiling the necessary documents.

1997-1998

- **Road development projects in the Essonne department.**

Project manager in charge of the following studies :
- Impact study, public enquiry documents prior to works and Water Law documents for the Prairie roundabout.
- Impact study, public enquiry documents prior to state approval, Water Law documents for the Beauvert half interchange

1996-1997

- **Doubling of the RN312 road between Bessan and Vias (Hérault), over 8 km.**

Project manager in charge of the following studies :
- Environmental study (original state),
- Impact study for the chosen solution including detailed noise and hydraulics studies.

- **Redevelopment of the RN196 trunk road between Ajaccio and Cauro. Diversion from the « Americans' bend » (Southern Corsica).**

In charge of producing the public enquiry documents prior to state approval.

1995-1996

- **A26 - Troyes/Auxerre motorway**

In charge of the environmental studies included in the preliminary design (80 km)

- **RN 193 trunk road- Corte-Omessa section (7 km)** in High Corsica.

In charge of the environmental studies included in the preliminary design and the preparation of the public enquiry documents required for state approval

- **RN 198 trunk road - Porto-Vecchio-Ste Lucie de Porto-Vecchio section (15 km)** in Southern Corsica.

Head of environmental studies for the preliminary design.

1994-1995

- **Environmental and impact studies for the RN 17 trunk road between Thélus and Vimy (10 km)** in the Pas de Calais.

Project manager in charge of the following studies :
- Environmental study (original state).
- Impact study for the solutions under consideration.
- Summary note.

- **Preliminary design documents for the redevelopment of the RN580 trunk road au droit de l'Ardoise (Gard), over 8 km.**

In charge of the followng studies :
- Study of the environment and the socio-economic situation.
- Impact study for the various possible solutions.

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curriculum vitae : Sylvie SOUCHON (cont'd)

- **Redevelopment project for the Dordogne Valley Road.**
- Feasibility study for the Port-de-Couze/Le Buisson section
  . In charge of studying the environment and the socio-economic situation
- Public enquiry documents for the Bergerac/Port de Couze section
  . Head of the impact study for the proposed solution,
  . Responsible for the summary report.

1994

- **Project to upgrade the Boulevard Laurent Bonnevay in Lyon.**
- Additional study included in the preliminary design bidding
  . Noise and landscape study.
- **Preliminary design for the A43 motorway in the Maurienne Valley**
- Synopsis of the preliminary environmental design
- **RN 88 trunk road between Marsac and Séverac-Le-Château (115 km in the Tarn and Aveyron departments)**
  Preliminary route design studies.
- Project manager, in charge of the environmental studies for the phase 2 preliminary design.

1993

- **Massy-La Francilienne secondary road link**
- Preliminary design documents, concertation documents, public enquiry documents.
  Head of :
  . environmental and socio-economic studies,
  . the impact study.

1992-1993

- **A51 Grenoble-Sisteron motorway -** Preliminary design and tender documents for a 35 km section.

Head of environmental studies (original state, constraints, impact et comparison of alignment alternatives).

- **RN113 to the East Montpellier urban motorway link (6 km) -** Preliminary design, pilot studies.

Head of environmental and impact studies.

HUNGARY

- **A section of the n°9 expressway including a bridge over the Danube in the Szeksard area (total length : 20 km).**
- Head of the environmental study included in the bid for the concession of this section.

1992

- **South Montpellier motorway bypass.** Preliminary study.

Analysis of the noise pollution relating to the various alignment alternatives.

- **Road link from Les Cayrons to Le Poutaouch, in the municipality of Vence (Alpes Maritimes).**
- In charge of the public enquiry documents :
  . Environmental study,
  . Impact study.

- **Link between the future A759 motorway and the A9, to the west of Montpellier -** Preliminary design study.
- Environmental study,
- Comparison of the impact of each alternative.

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Comment Letter O012 - Continued

O012 Exhibit C Included in O012-11

curriculum vitae : Sylvie SOUCHON (cont'd)

1991-1992

- **A26 Troyes-Auxerre. motorway**
- Preliminary design study :
  - . Production of the environmental and socio-economic studies required in the search for appropriate alignments solutions.
  - . Comparative analysis of the impact of the various alternatives (average length 70 km).

1991

- **580, 86 and 100, between Pont- St Esprit, les Angles and Remoulins.**
- Preliminary design for the development of a 35 km route (Gard and Vaucluse) :
  - . Diagnosis of the environment-related constraints and impact analysis.

SOCIO-ECONOMIC AND IMPACT ASSESSMENT STUDIES

1997

- **Massy-La Francilienne secondary road link**

Responsible for updating the economic and social evaluation documents as part of the L.O.T.I. (official regulation for transport organization in France).

1995-1996

- **A26 Troyes-Auxerre motorway**

In charge of the economic and social evaluation studies for the preliminary design.

1994

- **Dordogne Valley Road**
- Public enquiry documents for the Bergerac/Port de Couze section
- Evaluation of the economic and social effects of the project.

1993

- **Massy-La Francilienne secondary road link**

Evaluation of the economic and social effects of the project (en application de la L.O.T.I.)

1992

- **Lorraine regional centre (Thionville-Metz-Nancy area).**

Socio-economic study of the Lorraine regional centre and its potential for development within the European context (cartography).

1992

- **A31 motorway from Toul to the Luxembourg border.**

Assessment of the eventual saturation of the road :
- Socio-economic study (cartography).

1991

- **Hyères-La Foux road link -** Preliminary design study.

Socio-economic study aimed at assessing the potential for developing the RN98 trunk road to encourage economic and tourist activities whilst simultaneously preserving the natural landscape.

1989-1991

Study engineer for a research association linked to the University of Grenoble :
- Statistic and graphic processing of scientific and socio-economic data,
- Studies on the thermal potential of mountainous sites and agricultural lands with a view to development options.

1986-1988

Research grant to work in the Climatic Environment Team at the National Scientific Research Centre (CNRS) in Grenoble :
- Development of graphics software suited to the processing of meteorological data,
- Thesis on the variations in the pressure fields at high altitude over the Northern Hemisphere,
- Participation in national and international symposiums.

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O012 Exhibit C Included in O012-11

setec ferroviaire

Curriculum Vitae

Mise à jour : Février 2010 *Page 1 sur 2*

Christophe PERREAU

Date of birth	**1975**
Nationality	**French**
Qualifications	**BTS Travaux Publics (EBTP Vincennes – 1998)**
Position	**Senior Engineer**

Main references

Since February 2010 — ***Setec Ferroviaire***

Senior Engineer – head of Alignment Design Department

1999 - 2010 — ***SNCF (French National Railroad Company)***
Studies and Projects Department

Senior Engineer – head of Alignment Design Department

GPSO – South-western Great Projects
New High Speed lines of railway in South-western France : Bordeaux-Toulouse and Bordeaux-Spanish border : design of alignment and infrastructure for mixed high speed lines (high speed commercial trains + freight trains)

Calais-Dunkerque Project
Railroad outfitting and land settlement between Calais and Dunkerque (Northern France)

South Connection
Feasibility studies for a link between South-eastern and Western high speed lines in the South suburbs of Paris.

Tramway line in Angers
Design of alignment and infrastructure for the first line of tramway in the city of Angers (Western France)

Calais' Harbor
Design of service tracks and roads and estimating for the harbour of Calais (French North coast)

Mulhouse Short Junction
Alignment design and estimating for the junction between the city of Mulhouse and the new Rhin-Rhône Line (Eastern France)

Comment Letter O012 - Continued

O012 Exhibit C Included in O012-11

setec ferroviaire

Curriculum Vitae – (Suite) Christophe PERREAU

Mise à jour : Mars 2010 *Page 2 sur 3*

Austerlitz Station Project
Tracks covering for Paris' Southeast station

Trans-Alps High Speed Line
Feasibility and preliminary studies for a new high speed line (commercial + freight trains) through the Alps

Languedoc-Roussillon Project
Extension of the Mediterranean high speed line around the cities of Nîmes and Montpellier – design of rail head, road alignment

Electrification of conventional lines in Boulogne-sur-Mer's area (Northern France)

Reims-Epernay doubling project
Design and estimating of a second track between Reims et Epernay

Euroairport Bâle-Mulhouse
Design and estimating for a rail link to the airport of Bâle-Mulhouse (Swiss-French border)

O012 Exhibit D Included in O012-11

From: Tony Waller <aewaller@hotmail.com>
Subject: **Answers to your questions**
Date: April 26, 2010 2:22:26 PM PDT
To: David Schonbrunn <david@schonbrunn.org>

Anthony E. Waller
1147 Los Altos Ave. Ave.
Los Altos CA, 94022
650-430-9642 (c)
aewaller@hotmail.com

Dear Mr. Schonbrunn:

Regarding your questions on several railway operational issues involving the Bay Area and high speed rail, I will answer them below in no particular order.

Dumbarton Bridge Capacity

The present abandoned movable swing bridge across San Francisco Bay has a single-track leading to it. For its entire existence it was a useful component to the Southern Pacific Railroad. Its proposed use as access for high speed inter-city trains to The City of San Francisco and as an additional commuter rail route would not necessarily require double-tracking.

However, double tracking would ensure absolutely smooth operations and even provide for single-tracking as a back-up for maintenance and emergency situations. Hourly high speed trains in each direction will be no problem at all for such a bridge. A possible commuter service initially established with four peak direction trains to San Francisco in the two-hour morning peak and four returning in the evening would be easy to add. If the service proved successful and resulting in an all day fleet of, say, hourly trains all day, it could be scheduled with the commuter train always timed to immediately follow the high speed.

Railcar Buff Strength Issues

Caltrain has asked for a Federal waiver to able to operate low-buff-strength Electric Multiple Unit trains (EMUs) on its right-of way alongside its diesel-powered consists. If the federal government grants such permission, high-speed trains will be able to operate on the Dumbarton Rail Bridge, intermixed with diesel-powered local commuter trains. The only possible problem that might come would involve the slower acceleration of the diesel trains keeping pace while intermixed with the electric fleet. It also could well be that surplus rail cars of Caltrain could be put to work inaugurating the initial Dumbarton commuter rail service in a low capital cost start-up.

Comment Letter O012 - Continued

O012
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My Professional Background

With regards to my professional background, I grew up in Chicago and have worked around railroads for 33 years since leaving high school. I began my career "up against the iron" (in the words of the railroad colloquialism) in yard operations with Atchison, Topeka, & Santa Fe. After beginning graduate studies in Urban Planning with a concentration in transportation, I began working in the planning department with Metra, the Chicago-area commuter rail agency.

I have worked with several consulting firms as a rail operations simulation specialist in Los Angeles, Boston, New York, and New Jersey. I was most recently with the Bay Area's Caltrain system. The coordination of several different classes of rail operations onto mixed-use alignments (such as with local commuter, freight, and high speed and other inter-city passenger services) has been a professional specialty of mine. I have extensive background working the commuter rail systems of Chicago, New York, Boston and San Francisco; as well as proposed systems in Cleveland and Kansas City.

I hold a Bachelor of Science degree in business administration from Elmhurst College (Elmhurst IL) and a Masters degree in Urban Planning and Policy from the University of Illinois/Chicago.

Regards,

Anthony E. Waller

O012
Exhibit E
Included in
O012-12

From: "Humphrey, Scott " <Scott.Humphrey@uscg.mil>
Subject: **RE: Dumbarton Bridge**
Date: April 23, 2010 2:29:48 PM PDT
To: <David@schonbrunn.org>

Hello David,

Based on my experience, very few VTS San Francisco Vessel Movement Reporting System Users (VMRS Users) report transiting through the Dumbarton Bridge.

VMRS Users are the vessels that communicate (check in) with VTS.

I have no idea how many recreational vessels or other non-VMRS User vessels might transit through the bridge since they are not required to contact VTS on the radio.

Refer to 33 CFR 161.16 for an explanation of VMRS User (try this link http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=9f35d96581866d71f0ab68e76bf3cbce&rgn=div8&view=text&node=33:2.0.1.6.30.2.183.2&idno=33)

Hope this helps.

F. Scott Humphrey, Training Director
Coast Guard Sector San Francisco
Vessel Traffic Service (VTS)
Office PH: +1 415 399 7444
Mobile PH: +1 415 871 9057
Email: Scott.Humphrey@uscg.mil

-----Original Message-----
From: David@schonbrunn.org [mailto:David@schonbrunn.org]
Sent: Monday, April 12, 2010 9:40 AM
To: Humphrey, Scott
Subject: Dumbarton Bridge

Sir,

I recently found out that the Coast Guard's Area of Responsibility extends south to the Dumbarton Bridge. We are looking into the future use of the Dumbarton Rail Bridge for transit purposes.

Comment Letter O012 - Continued

O012
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O012-12

I spoke today with Vessel Traffic, who told me that there is no large commercial vessel traffic going south of the Dumbarton. It would be most helpful if you could send us a letter, at the address below, describing what vessel traffic, if any, passes through the Dumbarton Rail Bridge. It could be as simple as a one sentence recitation of what I was told today.

Thank you very much for your assistance. Please call me if you have any questions.

--David

David Schonbrunn, President
Transportation Solutions Defense and Education Fund (TRANSDEF)
P.O. Box 151439
San Rafael, CA 94915-1439

415-370-7250 cell & office

David@Schonbrunn.org
www.transdef.org

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Exhibit F
Included in
O012-12

Figure 3.9-22
Dumbarton High Bridge
B004295

Comment Letter O012 - Continued

O012
Exhibit F
Included in
O012-12

Figure 3.9-23
Dumbarton Low Trestle

B004296

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O012
Exhibit G
Included in
O012-14

TRACKAGE RIGHTS AGREEMENT ---
PENINSULA MAIN LINE AND SANTA CLARA/LICK LINE

This AGREEMENT dated as of December 20, 1991, is by and between the PENINSULA CORRIDOR JOINT POWERS BOARD, a joint powers agency created under California law, (hereinafter referred to as "Owner") and SOUTHERN PACIFIC TRANSPORTATION COMPANY, a Delaware corporation, (hereinafter referred to as "User");

RECITALS:

A. Owner and User have entered into a Purchase, Sale and Option Agreement dated as of November 22, 1991 ("Sale Agreement") providing, in part, for the purchase by Owner from User of certain properties in San Francisco, San Mateo and Santa Clara Counties, California including the Peninsula Main Line and the Santa Clara/Lick Line (both as defined in Section 1 hereof and as more fully described in Exhibit A hereto);

B. Pursuant to the Sale Agreement, Owner acquired the Peninsula Main Line and the Santa Clara/Lick Line for the purpose, in part, of providing Commuter Service (as defined in Section 1 hereof) and for any purpose other than those reserved exclusively to User in the Sale Agreement and User retained for itself and its successors and assigns a perpetual and exclusive easement (as set forth in the deeds and assignments conveying said properties) in and trackage rights over such properties acquired by Owner for User's present and future Freight Service and Intercity Passenger Service (both as defined in Section 1 hereof).

C. Owner and User desire to set forth the terms of the reservation by User of the trackage rights retained for User's exclusive present and future Freight Service and Intercity Passenger Service on the Peninsula Main Line and the Santa Clara/Lick Line.

D. Owner and User also desire to set forth the terms of Owner's Bridge Trackage Rights over User's Cahill/Lick Line for Gilroy Commuter Service (all as defined in Section 1 hereof).

NOW THEREFORE, it is mutually agreed by and between the parties hereto as follows:

(O:\tg\jpb)

(Main14.TRA)

Comment Letter O012 - Continued

O012
Exhibit G
Included in
O012-14

Section 1. DEFINITIONS

The following capitalized terms are used in this Agreement with the following meanings:

1.1 "AAR" shall mean the Association of American Railroads.

1.2 "Bridge Trackage Rights" shall mean exclusive Gilroy Commuter Service trackage rights for Gilroy Commuter Service Trains only over User's Cahill/Lick Line, over which segment there shall be no intermediate Gilroy Commuter Service station stops; however, Owner's Trains may enter or leave the segment at any point. These Bridge Trackage Rights are to be used only in conjunction with the trackage rights granted (pursuant to the Lick/Gilroy Trackage Rights Agreement) by User to Owner from Lick (at or near Milepost 51.4) to Gilroy (at or near milepost 80.7), for Trains in Gilroy Commuter Service.

1.3 "Cahill Yard" shall mean the yard in front of the San Jose passenger station at San Jose, California, as more fully described in Exhibit A hereto.

1.4 "Changes and/or Additions" shall mean any capitalized improvements including, without limitation, the additions, betterments, construction, reconstruction, modifications and renewals thereof and additional facilities, regardless of book treatment as an expense or capital item, but excluding capitalized maintenance provided for in Section 9.

1.5 "Commuter Service" shall mean the operation by Owner (or an Operator for Owner) of Trains that provide commute passenger service on the Joint Facilities (excluding User's Cahill/Lick Line) between San Francisco (at or near Milepost 0.147) and Lick (at or near Milepost 51.4), California in San Francisco, San Mateo and Santa Clara Counties, and frequently characterized by reduced fare, multiple-ride and monthly commutation tickets. Commuter Service as so defined shall not include Intercity Passenger Service. The term "Commuter Service" shall also include Owner's Trains and Equipment operated for the purpose of Equipment review, schedule checks, personnel training, Changes and/or Additions and maintenance of way activities.

1.6 "Customary Additives" shall mean elements of cost added to billings of either party to the other that generally are calculated as a percentage of direct labor costs and are intended to compensate for, without limitation, paid holidays, vacation and personal leave days, health and welfare benefits, payroll taxes and administrative and supervisory expenses that include direct and general overhead, inclusive of a customary one percent (1%) additive for special administrative costs related to billing

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preparation, and are subject to periodic changes depending upon industry practices and the provisions of Section 11.3. As an example of such additives, Exhibit B sets forth 1990 amounts as represented by SPT to JPB.

1.7 "Designated Freight Trackage" shall mean Trackage which is part of the Joint Facilities (excluding User's Cahill/Lick Line), which is located on real property owned by Owner (as described on Exhibit A hereto), which is used now or in the future solely for Freight or Intercity Passenger Service and which shall be maintained at the sole cost and expense of User (unless the parties have agreed in writing to use also by the Owner, in which case sharing of maintenance costs shall be as agreed to in writing by the parties notwithstanding the provisions of Section 9.1 hereof) including, without limitation, (i) the present yard Trackage at South San Francisco, (ii) the proposed gauntlet Track Structure between Milepost 3.18 and Milepost 5.26, (iii) storage Track Structure (for two tracks) between Bayshore at Milepost 4.9 and Brisbane at Milepost 7.1, and (iv) upon the approval of Owner (which shall not be unreasonably withheld), such additional Freight Service support Trackage and other facilities to meet User's Freight Service needs.

1.8 "Effective Date" shall have the meaning set forth in Section 11.12.

1.9 "Equipment" shall mean locomotives, cars, cabooses, hi-rail vehicles, other vehicles, and machinery which are capable of being operated on Joint Facilities.

1.10 "Exclusive Commute Trackage" shall mean that part of the Joint Facilities, excluding User's Cahill/Lick Line, (which is described by the designated line symbols on Exhibit A), including yard or other side Trackage used solely by Owner, and including but not limited to the double main Trackage from Santa Clara Junction to Cahill Yard, the passenger Trackage at Cahill Yard, the magnetic westerly main Trackage from Cahill Yard to Auzerais Street at Milepost 47.5 and all new Trackage which Owner may construct between Auzerais Street and Lick at Milepost 51.4, which Owner shall maintain at its sole cost and expense (unless the parties have agreed in writing to use also by User, in which case sharing of maintenance costs shall be as agreed to in writing by the parties notwithstanding the provisions of Section 9.1 hereof).

1.11 "Fiscal Year" shall mean the period beginning July 1 of any calendar year and ending June 30 of the following calendar year.

1.12 "Freight Service" shall mean User's railroad operations contemplated hereunder in furtherance of transporting freight commodities of all types and description in Trains whether loaded

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or empty, including personnel training, and the use of all Equipment and Non-Revenue Equipment for such operations.

1.13 "Gilroy Commuter Service" shall have the meaning set forth in Section 1.13 of the Lick/Gilroy Trackage Rights Agreement.

1.14 "ICC" shall mean the Interstate Commerce Commission.

1.15 "Intercity Passenger Service" shall mean intercity railroad passenger service (other than Commuter Service) provided by NRPC or any other Operator with whom User contracts to provide Intercity Passenger Service over the Joint Facilities in accordance with this Agreement.

1.16 "Joint Facilities" shall mean the Peninsula Main Line and the Santa Clara/Lick Line, Designated Freight Trackage, Exclusive Commute Trackage, and only that portion of the New Coast Main consisting of User's Cahill/Lick Line, and all Changes and/or Additions thereto now or in the future.

1.17 "Lick/Gilroy Trackage Rights Agreement" shall mean that agreement between User and Owner dated as of the date hereof which grants Owner trackage rights over the rail lines of User from milepost 51.4 at or near Lick to milepost 80.7 at or near Gilroy.

1.18 "Materials Additives" shall mean elements of cost customarily charged by railroads to one another and which are to be added to any and all materials cost billings of either party to the other and that generally are calculated as a percentage of direct costs, are intended to compensate for store, purchasing and handling expenses, sales or use taxes, foreign line freight, and on-line freight and are subject to periodic changes depending upon industry practices and the provisions of Section 11.3. As an example of such additives, Exhibit B sets forth 1989 amounts as represented by SPT to JPB.

1.19 "New Coast Main" shall mean Track Structure of (i) the No. 1 Track, (ii) User's Cahill/Lick Line, and (iii) all Track Structure located on property of Owner magnetic east of the Track Structure described in (i) and (ii) above, all as more fully described in Exhibit A hereto.

1.20 "Non-Revenue Equipment" shall mean Equipment which is maintenance of way equipment and freight cars that are either empty or loaded only with maintenance of way equipment or material and equipment transported for the internal use of either party including, without limitation, rails, ties, ballast, and other track materials, and signal and bridge materials and supplies.

1.21 "No. 1 Track" shall mean the existing yard Track Structure designated as User's "No. 1 Track" on the easterly side of the double main Track Structure between Milepost 44.0 at or near

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Santa Clara Junction and the southern end of Cahill Yard at or near Milepost 47.1.

1.22 "NRPC" shall mean the National Railroad Passenger Corporation, or Amtrak, in all circumstances other than in a capacity as Operator for Owner.

1.23 "NRPC Agreement" shall mean the Agreement between NRPC and User dated April 16, 1971, as amended from time to time.

1.24 "Operator" shall mean the person, firm, corporation or other legal entity utilized by Owner or User to conduct, on its behalf and for its account, operations on the Joint Facilities in accordance with this Agreement.

1.25 "Peninsula Main Line" shall mean the Trackage and the right-of-way and real estate underlying said Trackage between Milepost 0.147 at or near 4th and Townsend Streets in San Francisco County, California and Milepost 44.0 at or near Santa Clara Junction in Santa Clara County, California, all as more fully described in the Sale Agreement and in Exhibit A hereto.

1.26 "Sale Agreement" shall have the meaning set forth in Paragraph A of the recitals to this Agreement.

1.27 "Santa Clara/Lick Line" shall mean the Trackage and the right-of-way and real estate underlying said Trackage between Milepost 44.0 at or near Santa Clara Junction and Milepost 51.4 at or near Lick, all in Santa Clara County (including the fee ownership, easements (but excluding User's easements)), and franchises of the real estate and right-of-way underlying the Trackage) but excluding the New Coast Main, all as more fully described in the Sale Agreement and in Exhibit A hereto.

1.28 "Service(s)" shall mean Commuter Service, Freight Service and Intercity Passenger Service collectively or any of them individually, as applicable.

1.29 "SFGTF" shall have the meaning set forth in Section 9.2 and Exhibit D or as it may be amended by written agreement of the parties.

1.30 "Track Structure" shall mean rail and fastenings, switches and frogs complete, ties, ballast, and signals.

1.31 "Trackage" shall mean Track Structure and all appurtenances thereto, including without limitation, bumpers, roadbed, embankment, bridges, trestles, tunnels, culverts or any other structures or things necessary for support of and entering into construction thereof, and, if any portion thereof is located in a thoroughfare, the term shall include pavement, crossing planks and other similar materials or facilities used in lieu of pavement

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or other street surfacing material at vehicular crossings of tracks, culverts, drainage facilities, crossing warning devices, and any and all work required by lawful authority in connection with construction, renewal, maintenance and operation of said Track Structure and all appurtenances thereof and Changes and/or Additions thereto now or in the future.

1.32 "Train(s)" shall mean a locomotive unit, or more than one such unit, coupled, with or without cars or caboose.

1.33 "User's Cahill/Lick Line" shall mean the existing single main Track Structure between Cahill Yard at or near Milepost 47.1 and Lick at or near Milepost 51.4.

Section 2. RIGHTS OF OWNER AND USER

2.1 **User's Reservation:** Subject to the terms of this Agreement, User reserves the perpetual and exclusive right to conduct Freight and Intercity Passenger Service over the Joint Facilities (excluding User's Cahill/Lick Line which User retains ownership of, and excluding Exclusive Commute Trackage exceptto the extent provided in Sections 1.10 and 2.4 hereof). Owner confirms User's reservation of said right in the Sale Agreement.

2.2 **Authority:** Owner represents that it has the right and authority to confirm User's reservation of perpetual and exclusive trackage rights (which rights do not include Exclusive Commute Trackage except as provided in Sections 1.10 and 2.4 hereof) over the Joint Facilities (excluding User's Cahill/Lick Line) as contemplated herein without the concurrence or approval of any other person or entity, except for regulatory approvals or exemptions contemplated by Section 8.1 hereof.

2.3 **Ownership:**

(a) Owner shall own all of the Peninsula Main Line and the Santa Clara/Lick Line, including Designated Freight Trackage, existing at the date of execution of this Agreement.

(b) User shall own the New Coast Main, but Owner shall own the real property underlying the New Coast Main.

(c) Owner shall own those Changes and/or Additions and capitalized maintenance to the New Coast Main made at its sole cost and expense. User shall own such Changes and/or Additions and capitalized maintenance to the New Coast Main made at its sole cost and expense. Owner and User shall jointly own such Changes and/or Additions and capitalized maintenance to the New Coast Main made at their shared cost and expense in the same proportion as the respective shares of the cost and expense bears to the total cost

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and expense. Owner shall not remove any Changes and/or Additions or capitalized maintenance items to the New Coast Main without the written consent of User as long as User holds itself out to provide Freight or Intercity Passenger Service over the applicable portion of the New Coast Main or such Services have not been abandoned; provided, however, in the event that Owner has permanently ceased to provide Commuter Service over all or substantially all of the Santa Clara/Lick Line, User shall pay Owner for the unamortized value of such Changes and/or Additions made by Owner on the New Coast Main. At the time that User no longer holds itself out to provide Freight and Intercity Passenger Service and such Services have been abandoned, Changes and/or Additions or capitalized maintenance items shall be returned to Owner to the extent of Owner's interest in such Changes and/or Additions and capitalized maintenance items.

(d) Owner shall own all Changes and/or Additions to the Joint Facilities (other than User's Cahill/Lick Line) and all capitalized maintenance provided for in Section 9 hereof.

2.4 **User's Rights:** For the purpose of conducting Freight and Intercity Passenger Service, User has the perpetual right of access to and from and use of the Joint Facilities, except for the Exclusive Commute Trackage unless otherwise agreed to in writing by the parties. User shall also have perpetual rights, subject to the terms of this Agreement including the restrictions concerning the Exclusive Commute Trackage, solely to serve all existing and future industries, team or house tracks or branches located on or served off any existing or future turnouts or leads from or to the Joint Facilities or No. 1 Track. User shall have use of the Exclusive Commute Trackage for the sole purpose of obtaining necessary access to provide Freight Service to existing or future industries and branch lines served from the Joint Facilities or No. 1 Track. User's rights of use under this section, for the purposes specified in this section, shall be exclusive, and no other person or entity shall be entitled to or be granted any rights to such use for such purposes.

2.5 **Owner's Rights:** Subject to the limitations otherwise set forth in the Sale Agreement and in this Agreement, Owner (or any Operator designated by Owner) shall have the right to use existing and future Joint Facilities (excluding User's Cahill/Lick Line) for any purpose other than rail Freight and Intercity Passenger Service.

2.6 **Freight Trackage:** Except as may be otherwise agreed in writing by the parties, User retains the exclusive and perpetual ownership of and right to use and control the New Coast Main and User retains the exclusive and perpetual right to use and control the Designated Freight Trackage; however, User may allow Owner to use such portions of the South San Francisco Yard and other Designated Freight Trackage as User decides, from time to time, are

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not needed by User to support its operations. User shall not unreasonably withhold, condition, or delay its permission for such use; provided, however, that during such use, User's operations shall have priority over Owner's use. In such case, maintenance and capital expenses will be apportioned on a basis agreed by the parties in writing notwithstanding the provisions of Sections 9.1 and 10.2 hereof.

2.7 **Intercity Passenger Service Agreement:** Intercity Passenger Service on the Joint Facilities (except for User's Cahill/Lick Line) shall be subject to the following provisions:

(a) Owner shall permit User to allow NRPC Intercity Passenger Service Trains to be operated over the Joint Facilities (except for User's Cahill/Lick Line) in accordance with the terms of the NRPC Agreement in effect as of the date of this Agreement with the understanding that any change subsequent to the date of this Agreement in Intercity Passenger Service, including but not limited to the number or schedule of Trains, shall be subject to Owner's consent under Section 2.7(b) hereof.

(b) User may amend its present or any subsequent NRPC Agreement and enter into any new agreements and amendments thereto with NRPC or with any other party for the provision of Intercity Passenger Service over the Joint Facilities (except User's Cahill/Lick Line) with the consent of Owner, which shall not be unreasonably withheld, subject to the provisions of Section 4.3 when Owner dispatches and controls the operations and provided that costs due to any such Intercity Passenger Service agreement, or amendment thereto or to Intercity Passenger Service operations pursuant thereto over the Joint Facilities (except for User's Cahill/Lick Line) and costs of changes necessitated by such agreements affecting line capacity, yard capacity, or the signal system shall be borne by User. The parties agree to negotiate in good faith with regard to any additional parties that may be engaged or User proposes to have engaged in Intercity Passenger Service.

(c) Notwithstanding the provisions of Section 2.7(b) above, no Intercity Passenger Service Trains shall operate on Exclusive Commute Trackage without a written agreement between Owner and User.

2.8 **Operator:** Either party may use an Operator or Operators to provide applicable Services pursuant to this Agreement.

2.9 **Owner's Bridge Trackage Rights:** User shall grant to Owner exclusive Bridge Trackage Rights, as defined in Section 1.2, over User's Cahill/Lick Line. User shall not enter into any agreement with or permit any additional Operator of Freight or Intercity Passenger Service Trains on User's Cahill/Lick Line which would materially impair or interfere with Owner's rights or use

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pursuant to Section 4.5 hereof or under the Lick/Gilroy Trackage Rights Agreement. Upon completion of Owner's construction of its Trackage on the Joint Facilities between Auzerais Street at or near milepost 47.5 and Lick at or near milepost 51.4 and the commencement of Gilroy Commuter Service operations thereover, the Bridge Trackage Rights shall continue in effect only if User is granted access to and use of such newly constructed Owner's Trackage upon terms and conditions substantially similar to Owner's rights under the Bridge Trackage Rights and only so long as such access and use are made available to User (whether or not used by User).

2.10 **Physical Clearances:** Owner represents that the Joint Facilities (excluding User's Cahill/Lick Line) shall continue to have not less than existing clearances (as shown in User's records attached as Exhibit E) for the operation of Freight and Intercity Passenger Service. If User's Trains or Equipment require additional clearance, Owner agrees to provide said additional clearance in a timely manner at User's sole cost provided that such additional clearance would not materially impair or interfere with the usefulness or utility of the Joint Facilities (excluding User's Cahill/Lick Line) to Owner or Owner's operation or use of such Joint Facilities (excluding User's Cahill/Lick Line) or frustrate the purposes of this Agreement. In the event any work to be performed by Owner on the Joint Facilities (excluding User's Cahill/Lick Line) may affect the horizontal and vertical line clearances, Owner shall notify User and Owner shall cooperate with User to provide any such additional horizontal and vertical line clearances needed by User, provided that such additional clearances would not materially impair or interfere with the usefulness or utility of the Joint Facilities (excluding User's Cahill/Lick Line) to Owner or Owner's operation or use of such Joint Facilities (excluding User's Cahill/Lick Line) or frustrate the purposes of this Agreement and User shall pay the incremental costs required for such additional clearance requirements.

2.11 **Retention of Rights for Changes and/or Additions:** User retains the perpetual and exclusive right, for Freight and Intercity Passenger Service, to construct or reconstruct, with the consent of Owner (which shall not be unreasonably withheld, conditioned or delayed) Changes and/or Additions to the Joint Facilities (excluding User's Cahill/Lick Line and Exclusive Commute Trackage) consisting of railroad and railroad-related facilities necessary for and related to User's Freight and Intercity Passenger Service operations. Failure to reach agreement as to cost sharing for Changes and/or Additions subject to Section 10.3 shall constitute a reasonable basis for refusal of consent. Owner's consent will be given if such construction, reconstruction, or use shall not unreasonably interfere with Owner's existing or planned Commuter Service or with Owner's other planned or existing use of such portion of the Joint Facilities (excluding User's Cahill/Lick Line) and if the provisions of Section 8.3 are not otherwise

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invoked by Owner. Changes and/or Additions consisting of Track Structure crossing other Track Structure at grade shall be treated as any other Changes and/or Additions under this Section; provided, however, that such Changes and/or Additions consisting of at grade crossings which do not result in a decrease in average Train speeds over the applicable Trackage shall not, absent other construction or reconstruction, be considered an unreasonable interference with Owner's use or planned use of the Joint Facilities (excluding User's Cahill/Lick Line). Notwithstanding the above, User may construct Changes and/or Additions which Owner has advised may unreasonably interfere with its planned use of the Joint Facilities (excluding User's Cahill/Lick Line), at User's sole risk. Such risk shall include the costs of removal of such newly constructed Changes and/or Additions at the time of actual use by Owner. User also retains the perpetual right to use, construct, reconstruct, or reimburse Owner for the construction or reconstruction of Changes and/or Additions to User's Cahill/Lick Line without the consent of Owner as long as the provisions of Section 9.3 would not be violated. All other Changes and/or Additions to User's Cahill/Lick Line shall be subject to Section 10.6 hereof. User also retains the perpetual and exclusive right to use, construct or reconstruct Changes and/or Additions to the New Coast Main (excluding User's Cahill/Lick Line) without the consent of Owner, except to the extent any such Trackage may be subject to Section 10.6 hereof. User retains the perpetual and exclusive right to use all such Changes and/or Additions to the Joint Facilities referred to in this Section 2.11 for Freight and Intercity Passenger Service, subject to Owner's rights of use thereof in accordance with the terms of this Agreement.

2.12 **Emergencies and Detours:** Either party may, at its sole discretion, allow the other party to use the Trackage of said first party in the Joint Facilities or No. 1 Track in emergency and detour situations. Any such use shall be subject to the prior written consent and upon the terms and conditions of the party granting such use.

2.13 **Interim Operation Detour:** Notwithstanding the provisions of Section 2.12, unless the parties otherwise agree in writing, during the period from the Effective Date until Owner completes the Changes and/or Additions to No. 1 Track pursuant to Section 10.1(a) and (b) hereof, Owner grants its consent to allow User to use Owner's tracks consisting of Exclusive Commute Trackage between Santa Clara Jct. at or near Milepost 44.0 and the magnetic south end of Cahill Yard at or near Milepost 47.45. Such use shall be subject to the terms and conditions of this Agreement in the same manner and to the same extent as if User were operating over the Peninsula Main Line; provided, however, that, in lieu of Section 4.3, Owner shall establish reasonable terms and conditions for dispatching User's Trains in conjunction with Owner's Trains which shall minimize delays to both Owner's and User's operations; and further provided that notwithstanding the provisions of Section

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9.2, the costs of ordinary and capitalized maintenance of the Trackage over which User will operate pursuant to this Section 2.13 for the first two years after the Effective Date shall be solely the responsibility of Owner and, thereafter, such costs shall be apportioned between the parties in accordance with Section 9.2(a) hereof.

2.14 **Authority and Enforceability:** Each party hereto respectively represents and warrants that it has the full power and authority to enter into this Agreement and to carry out the obligations contemplated hereby. Upon execution and delivery, this Agreement, including but not limited to the indemnification terms of Section 6 hereof, are enforceable against such party in accordance with its terms (except to the extent such enforceability may be limited by bankruptcy, insolvency, reorganization, moratorium, or similar laws relating to creditor's rights generally and the availability of equitable remedies may be limited by equitable principles of general applicability).

2.15 **Retirement Limitations:** Subject to Section 8.3 hereof, neither Owner nor User shall make any retirement, withdrawal, elimination or disposal of any part of the Joint Facilities without the prior written consent of the other party which shall not be unreasonably withheld. The affected party will grant its consent under this Section if such retirement, withdrawal, elimination or disposal would not materially impair the usefulness of the Joint Facilities to such party or frustrate the purposes of this Agreement.

2.16 **Taxes:** Owner shall be responsible for all taxes assessed against it (or its Operators or other entities acting on its behalf or for its account), if any, as owner of the real and personal property which are part of the Joint Facilities (excluding User's Cahill/Lick Line) and of the real property underlying the New Coast Main and as holder of the Bridge Trackage Rights; provided, however, that User shall be responsible for any possessory interest tax assessed against it (or its Operators or other entities acting on its behalf or for its account), if any, as holder of the easement retained by User hereunder and under the Sale Agreement and as owner of the Track Structure and personal property which are part of the New Coast Main. Nothing contained in this Agreement shall be construed to make Owner liable to taxing authorities for any taxes which Owner, as a public entity, would not otherwise be liable; provided, however, that, for purposes of this Agreement, Owner shall indemnify User for all taxes assessed against any Operator for Owner or any other entity acting on Owner's behalf.

2.17 **Non-Use of Designated Freight Trackage:** In the event that all or any portion of the Designated Freight Trackage has not been used by User after the Effective Date for any continuous period of at least thirty-six (36) months, Owner may, during the

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period of continuous non-use in excess of thirty-six (36) months, request in writing that User make application for and diligently pursue all necessary approvals or other actions to remove such unused Trackage, if such approvals or other actions are necessary, and if Owner so requests, (upon receipt of any necessary authority) to remove at its cost any and all such Trackage and Equipment and property of User thereon. Within ninety (90) days of such request, User shall make application for such approvals or other actions or, if no approvals or other actions are necessary, shall commence , at its cost, removal of such Trackage, Equipment and property and shall diligently progress completion of such removal. If approvals or applications are necessary, User shall commence removal of such Trackage, Equipment and property within ninety (90) days after receipt of such authorization and shall diligently progress completion of such removal. User shall not progress the above actions if it demonstrates justification for such non-use, which justification shall be provided to Owner in writing within ninety (90) days of the written request of Owner referred to above. Within ninety (90) days of receipt by Owner of such written justification, Owner shall notify User in writing as to whether it concurs in or disputes such justification. If Owner disputes such justification, the dispute shall be resolved by arbitration in accordance with Section 7 of this Agreement. If, however, such non-use continues so that such Trackage has not been used by User for a continuous period of five (5) years, then User, promptly upon notice from Owner shall apply for and diligently prosecute all governmental approvals or other actions necessary, if any, to remove said Trackage and (after receipt of such approvals or other actions), shall promptly at its cost remove said Trackage and Equipment and property of User thereon, if requested by Owner.

Section 3. ASSIGNMENT

This Agreement shall be binding upon and inure to the benefit of the parties hereto, their respective successors and assigns, provided, however, that:

(a) The rights and obligations of Owner hereunder may be assigned or sold in whole or in part without User's consent only to (i) Owner's successor agency; (ii) any one or more of Owner's member agencies or counties; (iii) the Peninsula Rail Transit District; (iv) the State of California Department of Transportation; or (v) an existing or to be formed public, quasi-public or nonprofit entity formed or authorized to own Owner's interest in the Joint Facilities (excluding User's Cahill/Lick Line), but only if such successors or assigns have the legal power and authority to undertake all of the rights and obligations of Owner hereunder including, but not limited to, the obligation to indemnify User pursuant to Section 6 hereof;

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(b) User may assign or sell all or any part of its trackage rights hereunder without the consent of Owner only to: (i) any successor or affiliate of User, (ii) any other Class I railroad, or (iii) in connection with its trackage rights over the Santa Clara/Lick Line, to any Operator who is financially responsible and has a management team with a demonstrated record of reliable and safe railroad maintenance and operating experience; provided that such successors or assigns have the legal power and authority to undertake all of the rights and obligations of User hereunder including, but not limited to, the obligation to indemnify Owner pursuant to Section 6 hereof.

(c) User may assign or sell all or any part of its trackage rights hereunder to any person with the consent of Owner (which consent shall not be unreasonably withheld, conditioned or delayed) to any person and, in connection with its trackage rights over properties other than the Santa Clara/Lick Line, to any Operator who is financially responsible and has a management team with a demonstrated record of reliable and safe railroad maintenance and operating experience; provided that such party has the legal power and authority to undertake all of the rights and obligations of User hereunder including, but not limited to, the obligation to indemnify Owner pursuant to Section 6 hereof.

(d) Within ten (10) days after any assignment, the assignee shall execute and deliver to Owner and User a written instrument assuming all of the assignor's obligations hereunder, and an opinion of such assignee's counsel stating that such assignee is entitled to perform all of the assignor's obligations hereunder.

Section 4. OPERATIONS

4.1 **Management and Control:** Subject to Sections 4.2, 4.3, and 4.14 below, the management and operation (including dispatching) of the Joint Facilities (except for User's Cahill/Lick Line) shall be under the exclusive direction and control of Owner. User, at its sole cost and election may monitor dispatching operations over the Joint Facilities (excluding User's Cahill/Lick Line) on a reasonable basis. Owner, at its sole cost and election, may monitor dispatching operations over User's Cahill/Lick Line on a reasonable basis.

4.2 **Optional User Dispatching:** At Owner's option, User may continue to dispatch the Joint Facilities (excluding User's Cahill/Lick Line) in a manner that minimizes conflicts and is consistent with dispatching conditions existing prior to the Sale Agreement until Owner obtains dispatching capability; but, in no event later than December 31, 1993. Owner may, at its sole option, assume control and dispatching of the Joint Facilities (excluding User's Cahill/Lick Line) prior to December 31, 1993 by providing

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thirty (30) days advance notice to User. Owner shall pay User a monthly rate of Eleven Thousand Five Hundred Dollars ($11,500) for each full month or pro rata for partial months that User provides such dispatching services. Such monthly payment shall be made not later than 45 days following the end of the month in which dispatching services were provided.

4.3 **User's Operating Windows:** Owner will provide User the ability to operate Freight Service on the Peninsula Main Line whenever there exists a period of at least thirty (30) minutes headway between passenger Trains including Owner's Commuter Service and/or User's Intercity Passenger Service. During the hours between 10 A.M. and 3 P.M., at least one thirty (30) minute headway "window" on each of the northbound and southbound main tracks of the Peninsula Main Line will be provided in Owner's scheduling for Trains in Freight Service that are capable of operating at Commuter Service Train speeds and will operate at such speeds when directed by Owner. Between midnight and 5 A.M., at least one main track of the Peninsula Main Line shall always be in service for Freight and Intercity Passenger Service, and User will be provided during that time an adequate number of thirty (30) minute headway windows for User to serve its Freight Service customers. Owner and User recognize that Intercity Passenger Service may also be conducted during other than times between midnight and 5 A.M. and that such Intercity Passenger Service may operate within less than a thirty (30) minute headway. Such headway shall be established by mutual agreement between the parties, their Operators and NRPC, as applicable. Neither party hereto shall unreasonably withhold its consent to such agreement. Owner's dispatching and operations on lines other than the Peninsula Main Line shall provide User with reasonable windows for operations to serve customers during non-peak hours based upon a schedule subject to mutual agreement. Neither party hereto shall unreasonably withhold its consent to such agreement.

4.4 **Use of Exclusive Commute Trackage:** Owner shall have the exclusive use and control of its Exclusive Commute Trackage unless otherwise agreed in writing by Owner and User and subject to Section 2.4 hereof.

4.5 **Use of New Coast Main:** Except to the extent of Owner's Bridge Trackage Rights, User shall have the exclusive use and control for Freight and Intercity Passenger Service operations of the New Coast Main provided, however, that Owner shall retain the control over that portion of the New Coast Main to the extent and at the location such Track Structure connects to or diverges from the Joint Facilities (excluding User's Cahill/Lick Line). To facilitate such control, User shall physically provide Owner with the capability to connect User's dispatching system with Owner's dispatching system, and User and Owner shall share equally in the costs thereof. User shall have exclusive authority to dispatch and control its Freight and Intercity Passenger Service Trains on the

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New Coast Main and Gilroy Commuter Service Trains (which are operated over User's Cahill/Lick Line pursuant to Owner's Bridge Trackage Rights hereunder in conjunction with the Lick/Gilroy Trackage Rights Agreement). User shall dispatch all such Trains on User's Cahill/Lick Line on a "first-come, first served" basis, provided, however, that if User and Owner can reach agreement on a mutually satisfactory schedule for Gilroy Commuter Service Trains, pursuant to the Lick/Gilroy Trackage Rights Agreement, (and the parties expect to reach such agreement) User shall dispatch User's Cahill/Lick Line giving priority to those scheduled Gilroy Commuter Service Trains.

4.6 **Limitations on Liability:** Except as otherwise may be provided in Section 6, if the use of the Joint Facilities shall at any time be interrupted or traffic thereon or thereover be delayed for any cause, neither party shall have or make any claim against the other for loss, damage, or expense of any kind, caused by or resulting from such interruption or delay.

4.7 **Furnishing of Fuel, Train Supplies, Etc.:** Each party shall be responsible for furnishing, at its sole cost and expense, all labor, fuel, and Train supplies necessary for the operation of its own Trains over the Joint Facilities. In the event a party does furnish such labor, fuel, or supplies to another party hereto, the party receiving same shall promptly, upon receipt of billing therefor, reimburse the party furnishing same for its reasonable costs thereof, including Customary and Materials Additives.

4.8 **Operating Rules:** The operation by User on the Joint Facilities (excluding User's Cahill/Lick Line) shall at all times be in accordance with the rules, instructions, and restrictions of Owner. Except as otherwise provided herein, such rules, instructions, and restrictions shall be reasonable, just, and fair between the parties using the Joint Facilities and shall not unjustly discriminate against any of them.

4.9 **Communications:** The party using Trackage or Track Structure dispatched or controlled by the other party shall, at such using party's sole cost and expense, obtain, install and maintain in all Trains and Equipment used by it on such Trackage or Track Structure, such communication equipment as is necessary to allow the using party to communicate with dispatching and signaling facilities in the same manner as the dispatching party. The party in control of dispatching under the terms of this Agreement shall consult with the other party prior to adoption of new communication systems or signal systems for use on the Joint Facilities which theretofore have not been adopted generally in the railroad industry.

4.10 **Clearing Trains and Equipment:** If, by any reason of mechanical failure or for any other cause, the Trains or Equipment of Owner or User or their respective Operators become stalled or

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disabled on the Joint Facilities and are unable to proceed, or fail to maintain the speed required of Trains or Equipment to meet normal schedules, or if in emergencies crippled or otherwise defective Equipment is set out from any such Trains on the Joint Facilities, then the party whose Trains or Equipment are involved in the incident shall be responsible for furnishing locomotive units or such other assistance as may be necessary to haul, help or push such Equipment or Trains, or to properly move the disabled Trains or Equipment. By mutual agreement of the parties or upon receipt of reasonable notice from the other party that the response of the party whose Trains or Equipment are involved in the incident has not been adequate relative to the scheduled uses of Joint Facilities, such other party may render such assistance as may reasonably be required in light of such scheduled uses, and the party whose Trains or Equipment are involved in the incident shall reimburse the other party, within forty-five (45) days after receipt of the bill therefor, for the reasonable cost and expense, including Customary and Materials Additives, of rendering any such assistance. The costs and expense of services referenced above in this Section 4.11, including without limitation liability (as that term is defined in Section 6) shall be treated in accordance with Section 6 hereof. If it becomes necessary to make repairs to crippled or defective Trains or Equipment of the Owner or User or their respective Operators in order to move Trains or Equipment from the Joint Facilities, such work shall be the responsibility of the party whose Trains or Equipment are involved in the incident. By mutual agreement of the parties or upon receipt of reasonable notice from the other party that the efforts of the party whose Trains or Equipment are involved in the incident to make the repairs are not adequate in light of the scheduled uses of Joint Facilities, such other party may take control of the repairs. If the repairs are performed by the other party, then the party whose Trains or Equipment are involved in the incident shall reimburse the other party for the cost thereof, within forty-five (45) days after receipt of the bill therefor, at the then current AAR dollar rate for labor charges found in the Office Manual of the AAR Interchange Rules.

4.11 Clearing Wrecks: Except as otherwise provided in Section 6, whenever the Owner's or User's Trains or Equipment on the Joint Facilities require rerailing, wrecking service or wrecking Train service, the party whose Train is involved shall be responsible for performing such service. Upon mutual agreement of the parties or upon receipt of reasonable notice from the other party that the response of the party whose Train is involved in the incident is not adequate in light of the scheduled uses of the applicable Trackage, the other party may take control of such rerailing, wrecking service or wrecking Train service as may be required. Whichever party has responsibility for maintenance and repair of the affected Trackage under the terms of Section 9 shall make such repairs to and restoration of the applicable Trackage as may be required. The cost and expense of services referenced above

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in this Section, including without limitation, liability (as that term is defined in Section 6) shall be treated in accordance with Section 6 hereof. All Equipment and salvage shall be promptly picked up by the party whose Train is involved in the incident or such party's Operator or delivered to the party whose Train is involved in the incident or such party's Operator by the other party, and all costs and expenses, including Customary and Material Additives therefor, incurred by the other party shall likewise be paid to the other party by the party whose Train is involved in the incident. All costs and expenses to be borne under this Section by the party whose Train is involved in the incident shall be paid within forty-five (45) days after receipt of the bills therefor.

4.12 Furnishing Power: For the purposes of this Section 4.12 only, the term "stopped party" shall mean whichever of the following described entities whose Trains are stopped in the circumstances described in this Section: Owner, User, the Operator(s) of either Owner or User, NRPC, or any other entity permitted in accordance with the terms of this Agreement to operate Trains on the Joint Facilities. In the event Trains of a stopped party shall be forced to stop on the Joint Facilities for any reason including but not limited to, stoppage due to insufficient hours of service remaining among the stopped party's employees, and such Trains are unable to proceed, any entity referred to in this Section shall have the option to furnish motive power or such other assistance (including but not limited to the right to recrew stopped party's Trains) as may be necessary to haul, help or push such Trains, or to properly move Trains off the Joint Facilities. All cost and expense, including Customary and Materials Additives, to be borne by the stopped party under this Section shall be paid within forty-five (45) days to the party rendering motive power or other assistance after receipt of the bills therefor. Owner shall be responsible to the party rendering motive power for stoppage caused by its Operator(s) or other entities operating on its behalf and User shall be responsible to the party rendering motive power for stoppage caused by its Operator(s) or other entities operating on its behalf.

4.13 Compliance with Laws: Operations by Owner and User hereunder shall be in compliance in all material respects with all applicable laws and regulations including those relating to discharge of hazardous waste materials.

4.14 Assumption of Dispatching: In the event Owner becomes incapable of adequately performing dispatching functions on the Joint Facilities (excluding User's Cahill/Lick Line) for Freight and Intercity Passenger Service hereunder, arrangements will be made for the prompt and orderly transfer of such functions to User. In the event User becomes incapable of adequately performing dispatching functions on User's Cahill/Lick Line for Gilroy Commuter Service hereunder, arrangements will be made for the prompt and orderly transfer of such functions to Owner.

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Section 5. EMPLOYEES

5.1 **Owner's Employees:** Owner shall employ all persons necessary to construct, maintain, repair, renew, and perform dispatching functions for the Joint Facilities excluding User's Cahill/Lick Line (but including signal system maintenance on the New Coast Main as provided in Section 9.1). Owner shall be bound to use reasonable and customary care, skill and diligence in the construction, maintenance, repair renewal, and dispatching functions respecting said Trackage and in managing same and User shall not (except as otherwise provided in Section 6 hereof), by reason of Owner's performing or failing or neglecting to perform any construction, maintenance, repair, renewal, dispatching functions, or management of said Trackage, have or make against Owner any claim or demand for any loss, damage, destruction, injury, or death whatsoever resulting therefrom.

5.2 **User's Employees:** User shall employ or cause to be employed all persons necessary to construct, maintain, repair, renew, and perform dispatching functions for the New Coast Main. User shall be bound to use reasonable and customary care, skill, and diligence in the construction, maintenance, repair, renewal, and dispatching functions respecting the New Coast Main and in managing same; and Owner shall not (except as otherwise provided in Section 6 hereof), by reason of User's performing or failing or neglecting to perform any construction, maintenance, repair, renewal, dispatching functions, or management of said Track Structure, have or make against User any claim or demand for any loss, damage, destruction, injury, or death whatsoever resulting therefrom.

5.3 **Fair Treatment:** All officers, agents, and employees of Owner and of User engaged in the management, operation, and maintenance of the Joint Facilities or any portion thereof shall perform their duties in a fair, impartial, and just manner with respect to the rights and obligations between the parties as provided in this Agreement.

5.4 **Examinations:** User, or User's Operator, and Owner, or Owner's Operator, shall require their respective employees to pass periodic examinations on the General Code of Operating Rules effective October 29, 1989, (or any successor publication), timetables, General Orders and Track Bulletins (all as amended from time to time) which shall be applicable to the operations on or along the Joint Facilities.

5.5 **Rules Violations:**

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(a) Owner, or Owner's Operator, shall notify User in writing specifying the circumstances in the event User, User's employees, or User's Operator or any other entity with which User contracts to provide Intercity Passenger Service fails to abide by the rules, instructions and restrictions of the Owner, or Owner's Operator, governing the operation on or along the Joint Facilities (other than User's Cahill/Lick Line). User, User's Operator, or any other entity with which User contracts to provide Intercity Passenger Service shall take prompt action to correct the failure to abide by the rules, instructions, and restrictions of the Owner, or the Owner's Operator, governing the operation on or along the Joint Facilities (excluding User's Cahill/Lick Line). In the event User, User's Operator, or any other entity with which User contracts to provide Intercity Passenger Service must hold a formal investigation pursuant to a collective bargaining agreement relating to the neglect, refusal or failure of User, User's employees, User's Operators or any other entity with which User contracts to provide Intercity Passenger Service to abide by the rules, instructions, and restrictions of the Owner, or Owner's Operator, governing the operation on or along the Joint Facilities, (excluding User's Cahill/Lick Line) Owner, or Owner's Operator, shall cooperate with User, User's Operator, or any other entity with which User contracts to provide Intercity Passenger Service and make available personnel of Owner, or Owner's Operator, as witnesses for User, or User's Operator, in such formal investigation at the cost and expense of User.

(b) For operations over User's Cahill/Lick Line, the provisions of Subsection (a) of this Section 5.5 shall apply with Owner subject to the obligations of User and User subject to the obligations of Owner.

Section 6. LIABILITY

6.1 **Assumption of Responsibility:**

(a) Except as otherwise provided in Section 4.11 each of the parties hereto shall assume, bear and pay all the liabilities allocated to it as the responsible party under the terms of this Section 6. For purposes of this Section 6, the term "liability" shall include all loss, damage, cost, expense (including costs of investigation and attorney's fees and expenses at arbitration, trial or appeal and without institution of arbitration or suit), liability, claims and demands of whatever kind or nature arising out of an incident described in the applicable provision of this Section 6. Except as otherwise expressly provided in Sections 6.2(b), 6.2(d), 6.2(e), and 6.4, the responsibility for liabilities undertaken by each party under this Section 6 is without respect to fault, failure, negligence, misconduct, malfeasance or misfeasance of any party or its employees, agents or servants.

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(b) All costs and expenses incurred in connection with the investigation, adjustment and defense of any claim or suit shall be included as part of the liability for which responsibility is assumed under the terms of this Section 6, including salaries or wages and associated benefits of, and out-of-pocket expenses incurred by or with respect to, employees of either party engaged directly in such work and a reasonable amount of allocated salaries and wages of employees providing support services to the employees so engaged directly in such work.

6.2 Allocation of Responsibilities:

(a) Liability for personal injury (including bodily injury and death) to, or property damage suffered by, an invitee of either party shall be the responsibility of and borne and paid solely by that party regardless of the cause of such loss or the fault of either party or whose Train or Equipment was involved, except as specifically provided in Section 6.2(b) and Section 6.4 below. For purposes of this paragraph, and without limitation, consultants and contractors of a party and any person who is on a Train or Equipment operated by or for the account of a party (other than an employee of a party engaged in performing duties for that party) shall be deemed to be an invitee of that party. All persons at or adjacent to a passenger station or loading platform shall be deemed to be invitees of Owner (other than employees, contractors and consultants, including employees of such contractors, of User or Operator of User engaged in performing duties for User or for any such Operator of User).

(b) After Owner shall have incurred aggregate liability under this Agreement and the Lick/Gilroy Trackage Rights Agreement in an amount equal to $25.0 million for injury to or damage suffered by its invitees for incidents occurring in any one calendar year, User shall bear a share of that portion of the aggregate liability to the Owner's invitees for that year that is in excess of $25.0 million in proportion to the User's relative degree of fault, if any; provided, that the User shall not bear liability to Owner's invitees in an amount in excess of $125.0 million for incidents occurring under this Agreement and the Lick/Gilroy Trackage Rights Agreement in such calendar year. In computing the $25.0 million base amount payable by Owner prior to any participation by the User, there shall be excluded any liabilities incurred due to the Excluded Conduct (defined below in Section 6.4) of Owner. After User shall have incurred aggregate liability under this Agreement and the Lick/Gilroy Trackage Rights Agreement in an amount equal to the $25.0 million for injury to or damage suffered by its invitees for incidents occurring in any one calendar year, Owner shall bear a share of that portion of the aggregate liability to User's invitees for that year that is in excess of $25.0 million in proportion to Owner's relative degree of fault, if any; provided, that Owner shall not bear liability to

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User's invitees in an amount in excess of $125.0 million for incidents occurring under this Agreement and the Lick/Gilroy Trackage Rights Agreement in such calendar year. In computing the $25.0 million base amount payable by User prior to any participation by Owner, there shall be excluded any liabilities incurred due to the Excluded Conduct of User. Liability shall be deemed incurred on the date of the incident giving rise to such liability regardless of the date on which liability is paid or established. The determination of the relative fault of the parties in any proceeding establishing the liability shall be binding on the parties.

(c) Liability for personal injury (including bodily injury and death) to, or property damage suffered by, persons other than invitees of either Owner or User and casualty losses to property owned by the Owner and/or User shall be the responsibility of and borne and paid by the parties as follows regardless of the cause of such loss or the fault of either party except as provided in paragraphs (d) and (e) of this Section 6.2 and Section 6.4 below:

(i) Loss to Trains, Equipment and other property owned by Owner shall be the responsibility of the Owner and borne by it.

(ii) Loss to Trains, Equipment and other property owned by and freight transported by the User shall be the responsibility of the User and borne by it.

(iii) Loss to property jointly used by both parties and property jointly owned by Owner and User shall be the responsibility of and borne (A) totally by the single party whose Train or Equipment was involved in the incident giving rise to the loss, (B) equally by the parties if the Trains or Equipment of both parties were involved in the incident, and (C) by the party or parties responsible for costs of maintenance of the property pursuant to the cost allocation principles of Section 9 hereof if no party's Train or Equipment was involved in the incident.

(iv) Liability for personal injury (including bodily injury and death) to, or property damage suffered by, any employee of either party which occurs during the course of employment or while traveling to or from employment (an "employee") shall be the responsibility of and borne solely by the party employing such employee.

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(v) Liability for personal injury (including bodily injury and death) to, or property damage suffered by, any person who is not an employee or invitee of either party (including without limitation persons using vehicular and pedestrian crossings and trespassers) shall be the responsibility of and borne (A) totally by the party whose Train or Equipment was involved in such loss if the Train or Equipment of only one party was involved, and (B) by the Owner if no Train or Equipment was involved in the incident; provided, however, that if no Train or Equipment was involved and the incident occurred on User's Cahill/Lick Line, User shall be responsible.

(d) Liability for personal injury (including bodily injury and death) to, or property damage suffered by, a person who is not an employee or invitee of either party shall be the responsibility of and borne by both parties in proportion to their relative degrees of fault if Trains or Equipment of both parties were involved in the incident giving rise to such injury or damage.

(e) Except to the extent of any contrary provision in the Sale Agreement, each party shall indemnify and hold harmless the other party, and that party's directors, officers, employees, agents, successors and assigns, and defend them with counsel reasonably satisfactory to the indemnitee, from and against any and all Environmental Claims, Environmental Expenses, and any damages or liabilities arising out of the discharge or release of any Hazardous Materials in, on or about the Joint Facilities by such party, or its employees, contractors, lessees, invitees, representatives, agents, Operators (including, but not limited to, NRPC), successors, or assigns. User shall further indemnify and hold Owner harmless, and defend Owner with counsel reasonably satisfactory to Owner, against any damages or liability caused by or arising out of a release or discharge of Hazardous Materials in, on or about the Joint Facilities occurring prior to the Effective Date of this Agreement. For purposes of this Subsection, the capitalized terms not otherwise defined in this Agreement shall have the meaning as the definition given to these terms in that certain Environmental Indemnity Agreement between the parties which is part of the Sale Agreement. Nothing herein is intended to, nor shall abrogate the rights and responsibilities of the parties contained in the aforesaid Environmental Indemnity Agreement.

6.3 Insurance:

(a) Owner and User shall each maintain general liability insurance in the amount of at least $100,000,000 per occurrence and shall either include all of their respective Operators (other than NRPC) as insureds under their respective policies or furnish

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evidence of separate insurance of the same amount and type for each Operator (other than NRPC). Insurance shall be placed with a company or companies authorized to conduct business in California. Owner and User (and any Operator of either party if such Operator demonstrates to the reasonable satisfaction of the Owner and User sufficient financial capacity) may self insure to a level not to exceed $10.0 million.

(b) The general liability insurance required by Section 6.3(a) shall provide coverage for personal injury, bodily injury, death and property damage with respect to all operations of the Owner, User, and Operators, respectively. Such insurance shall include blanket contractual coverage, including coverage for written, oral and implied contracts and specific coverage for the indemnity provisions set forth in this Section 6. Each policy of general liability insurance obtained by the Owner and User shall name the other as an additional insured with respect to any liability to be borne by the party obtaining such insurance pursuant to the provisions of this Section 6.

(c) For any claims arising out of activities, products or operations resulting from or related to this Agreement, the insurance obtained pursuant to Section 6.3(a) shall be primary with respect to the obligation under this Agreement of the party obtaining the insurance and with respect to the interests of all parties added as additional insureds. Any other insurance maintained by an additional insured shall be excess of this coverage herein defined as primary and shall not contribute with it.

(d) Unless otherwise agreed by the Owner and User, the insurance required by Section 6.3(a) shall be maintained by each of the parties specified therein for the full term of this Agreement and shall not be permitted to expire or be canceled or materially changed except upon sixty (60) days' written notice to the other parties. Each insurance policy required by Section 6.3(a) shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, or reduced in coverage or limits except after sixty (60) days' prior written notice has been given to all insureds.

(e) Each of Owner and User shall cause its and/or its Operator's (other than NRPC's) insurers to provide the other with certificates of insurance and endorsements evidencing the provisions specified above in this Section 6.3 prior to commencement of operations under this Agreement.

(f) A failure of any party to maintain the insurance required by this Section 6.3 shall not relieve such party of any of its liabilities or obligations under this Agreement.

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6.4 Limitations on Indemnification:

(a) The provisions of this Section 6.4 shall apply notwithstanding the provisions of Section 6.2 above. "Excluded Conduct" shall mean (i) an entire failure of care or the exercise of so slight a degree of care as to raise a presumption that there was a conscious indifference to the things and welfare of others, (ii) conduct constituting a reckless or wanton disregard of the probable results of such conduct, (iii) wilful misconduct, or (iv) conduct which would permit the award of exemplary or punitive damages. Neither party shall be indemnified for any loss or liability resulting from its own Excluded Conduct, and in any such case such party shall be responsible for and bear loss or liability in proportion to its relative degree of fault and such party shall be responsible for and bear all exemplary or punitive damages, if any, resulting from its Excluded Conduct. If any of the provisions of Section 6.2 would otherwise indemnify a party against liability, loss or damage that would be prohibited by or unenforceable under the laws of the State of California (including a determination that indemnification under the circumstances involved is against the public policy of the state), the indemnity provided by such provision shall be deemed to be limited to and operative only to the maximum extent permitted by law. Without limitation, if it is determined that any law or public policy of the State of California prohibits the indemnification of a party for its own sole negligence in any instance covered by the provisions of Section 6.2, those provisions shall be deemed to exclude indemnification for such party's sole negligence but to permit full indemnification, as specified in Section 6.2, if both parties were negligent. In the case of any liability, loss or damage for which the provisions of this Section 6.4 would prevent the indemnification of a party, such party shall be responsible for and bear such liability, loss or damage.

(b) Notwithstanding Section 6.2 above, Owner and User shall bear liability in proportion to their relative degrees of fault if, but only if, the liability arises solely out of a collision between a Train of Owner and a Train of User that occurs on User's Cahill/Lick Line during a "peak commuter period", as hereinafter defined, on a day during which Owner operates scheduled Gilroy Commuter Service Trains. This Subsection 6.4(b) shall cease to apply upon completion of Owner's construction of its Trackage on the Joint Facilities between Azurais Street at or near Milepost 47.5 and Lick at or near Milepost 51.4 and the commencement of the Gilroy Commuter Service operations thereover. As used in this Section 6.4(b), the term "peak commuter period" shall mean a single uninterrupted period in the morning and a single uninterrupted period in the afternoon to be designated by Owner from time to time upon not less than 90 days written notice from Owner to User; provided, however, that neither of such periods shall exceed five (5) hours and the two periods together shall not exceed nine (9) hours in the aggregate.

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6.5 Scope of Indemnification:

In any case where a party is required under the provisions of this Section 6 to bear a loss or liability, it shall pay, satisfy and discharge such liability and all judgments that may be rendered by reason thereof and all costs, charges and expenses incident thereto, and such party shall forever indemnify, defend and hold harmless the other party and its commissioners, directors, officers, agents, employees, shareholders, parent corporation and affiliated companies or governmental entities from, against and with respect to any and all liabilities which arise out of or result from the incident giving rise thereto. If a party asserts that the other was guilty of Excluded Conduct and denies liability for indemnification of the other party based thereon, the party asserting such Excluded Conduct shall have the burden of proof in establishing such conduct. It is the intent of the parties that the indemnification provisions of this Section 6 shall apply to both the passive negligence and the active negligence of an indemnified party.

6.6 Procedure:

(a) If any claim demand shall be asserted by any person against an indemnified party under this Section 6, the indemnified party shall, within 30 days after notice of such claim or demand, cause written notice thereof to be given to the indemnifying party, provided that failure to notify the indemnifying party shall not relieve the indemnifying party from any liability which it may have to the indemnified party under this Section 6, except to the extent that the rights of the indemnifying party are in fact prejudiced by such failure. If any such claim or demand shall be brought against the indemnified party and it shall have given notice thereof to the indemnifying party, the indemnifying party shall have the right, at its own expense, to control (including the selection of counsel reasonably satisfactory to the indemnified party) or to participate in the defense of, negotiate or settle, any such claim or demand, and the parties hereto agree to cooperate fully with each other in connection with any such defense, negotiation or settlement. In any event, the indemnified party shall not make any settlement of any claims which might give rise to liability on the part of the indemnifying party under this Section 6 without the prior written consent of the indemnifying party, which consent shall not be unreasonably withheld, conditioned or delayed. If any claim or demand relates to a matter for which the parties, under the terms of Section 6.2, are to share liability equally or in proportion to their relative degrees of fault, each party shall be entitled to select its own counsel and defend itself against the claim at its own expense, and neither party shall make any settlement of any such claims without the prior written consent of the other party, which consent shall not be unreasonably withheld, conditioned or delayed.

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(b) Subject to the provisions of Section 6.6(a), on each occasion that the indemnified party shall be entitled to indemnification or reimbursement under this Section 6, the indemnifying party shall, at each such time, promptly pay the amount of such indemnification or reimbursement. If the indemnified party shall be entitled to indemnification under this Section 6 and the indemnifying party shall not elect to control any legal proceeding in connection therewith, the indemnifying party shall pay to the indemnified party an amount equal to the indemnified party's reasonable legal fees and other costs and expenses arising as a result of such proceeding.

(c) Any dispute between the parties as to the right to indemnification or the amount to which it is entitled pursuant to such right with respect to any matter shall be submitted to arbitration pursuant to Section 7.

6.7 **Operators:**

Any Operator other than NRPC shall agree to be bound by the provisions of this section 6 unless otherwise agreed in writing by Owner and User. The parties will use reasonable efforts to extend the benefits of existing NRPC indemnities to Owner. For purposes of this Section 6, as between Owner and User, the Trains, Equipment, and actions of any Operator (including NRPC) or any other entity acting on behalf of and for the account of a party hereto shall be deemed to be the Trains, Equipment, and actions of such party. Nothing contained herein shall be construed to limit or waive the rights of a party hereto to seek indemnification or damages from its Operator(s) or other entities acting on its behalf, for actions of said Operator(s) or said entities.

6.8 **Dollar Amount Adjustments:**

Each of the dollar amounts set forth in Section 6.3(a) above shall be adjusted annually and every three years, respectively, for changes in the Consumer Price Index, but shall not be reduced below their initial levels. As used in this Section 6.8, the term "Consumer Price Index" shall mean the United States Department of Labor's Bureau of Labor Statistics' Consumer Price Index, All Urban Wage Earners and Clerical Workers, All Items, for the San Francisco area (1967=100). If the base year for the Consumer Price Index is changed from 1967, the Consumer Price Index shall be converted in accordance with the conversion factor published by the United States Department of Labor's Bureau of Labor Statistics. If the Consumer Price Index is discontinued or revised, such other governmental index or computation with which it is replaced shall be used in order to obtain substantially the same result as would be obtained if the Consumer Price Index had not been discontinued or revised.

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6.9 **Not For Benefit Of Third Parties:**

The provisions of this Section 6 are not intended to confer any right, benefit, or cause of action upon any third party and are intended solely to deal with the allocation of liability, if any, as between the parties to this Agreement.

7. DISPUTE RESOLUTION AND BINDING ARBITRATION

7.1 **Settlement of Disputes:** Both of the parties hereto shall make every reasonable effort to settle any disputes arising out of their respective rights and obligations under this Agreement by prompt and diligent negotiations.

7.2 **Controversies Subject to Arbitration:** Any and all claims, disputes or controversies between Owner and User arising out of or concerning the interpretation, application or implementation of this Agreement, which cannot be resolved by the parties by negotiations, shall be submitted to binding arbitration as hereinafter provided.

7.3 **Arbitration Procedure:** The procedure for arbitration shall be as follows:

(a) In the event a claim, dispute or controversy subject to arbitration hereunder arises, either party may serve a written demand for arbitration in accordance with Section 7.3 of this Agreement upon the other party. If the claim, dispute or controversy is not resolved by the parties within thirty (30) calendar days after the service of the demand, the matter will be deemed submitted to arbitration.

(b) Within fifty (50) calendar days of service of a demand for arbitration, each party shall designate an arbitrator in writing and serve its designation upon the other party ("Noticed Party") in accordance with Section 7.3 of this Agreement. If the Noticed Party fails to timely designate the arbitrator to be designated by it, such arbitrator shall be appointed by the Presiding Judge (or Acting Presiding Judge) of the Superior Court of the County of Sacramento, State of California upon application of either party after ten (10) days' written notice to the other party. If each party has timely designated its arbitrator, or the Presiding Judge or Acting Presiding Judge has appointed an Arbitrator for one of the parties pursuant to the previous sentence, the two designated arbitrators shall, within seventy (70) calendar days of service of the demand for arbitration, designate a neutral third party arbitrator. The third party arbitrator shall be a qualified disinterested person, knowledgeable and experienced in rail operational matters and in the type of services contemplated by this Agreement. If the two arbitrators designated

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by the parties fail to timely select a neutral third party arbitrator, either party may apply to the Presiding Judge (or Acting Presiding Judge) of the Superior Court of the County of Sacramento, State of California to select the neutral third party arbitrator.

(c) At any time, the parties may agree in writing on a sole arbitrator to decide the controversy.

7.4 **Rules of Arbitration:** The arbitration is to be conducted pursuant to Part 3, Title 9, of the Code of Civil Procedure, commencing with Section 1280, or to any successor or replacement provisions of said Code, and the arbitrators shall have all the powers and duties specified therein.

7.5 **Arbitration Schedule:** (a). The arbitration hearing shall commence no later than four months after service of the demand and shall be concluded no later than forty (40) calendar days after the hearing commencement date. The arbitration decision and award shall be rendered by the arbitrators within thirty (30) calendar days after conclusion of the arbitration hearing.

(b) The parties may extend any of the deadlines or time periods set forth above by mutual written stipulation. The arbitrators may extend the time for commencement of the arbitration hearings, conclusion of the arbitration hearings and/or the time for rendition of the arbitrators' decision and the award (but, with respect to rendition of the arbitration award, by no longer than an additional 30 calendar days), upon motion of either party or upon the arbitrator's own motion, upon a showing of good cause therefor.

7.6 **Pending Resolution:** During the pendency of such arbitration proceedings, the business, the operations to be conducted, physical plant to be used, and compensation for service under this Agreement, to the extent that they are the subject of such controversy, shall continue to be transacted, used, and paid in the manner and form existing prior to the arising of such controversy, unless the arbitrator shall make a preliminary ruling to the contrary. In the case of monetary disputes relating to amounts billed for the payment of operating, maintenance or capital costs and expenses under the terms of this Agreement, the party from whom a payment is allegedly owing shall make such payment notwithstanding such dispute and may submit the dispute to arbitration under this Section 7 only by seeking a refund through such arbitration.

7.7 **Cost of Arbitration:** Each party hereto shall bear the costs and expenses incurred by it in connection with such arbitration, including the cost of the arbitrator appointed by it, and both parties shall share equally the costs and expenses attributable to the services of the third arbitrator.

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7.8 **Compliance:** For all purposes of this Agreement, each party is responsible for the compliance with all provisions of this Agreement by its Operator or Operators and User shall be responsible for compliance by NRPC.

Section 8. GOVERNMENTAL APPROVAL, TERM, AND ABANDONMENT

8.1 **Applications:** User shall, at its own cost and expense, initiate by appropriate application or petition and thereafter diligently prosecute any necessary proceedings for the procurement of consent, approval, or authority from any governmental agency for the sanction of this Agreement and the operations to be carried on by User hereunder. Owner, at its expense, shall assist and support said application or petition and will furnish such information and execute, deliver, and file such instrument or instruments in writing as may be necessary or appropriate to obtain such governmental consent, approval, or authority. User and Owner agree to cooperate fully to procure all such necessary consent, approval, or authority.

8.2 **Term:** Except as otherwise provided in Section 8.3 hereof, the term of the Agreement and the trackage rights provided for hereunder shall be perpetual.

8.3 **Abandonment or Discontinuance:**

(a) In the event that Owner contracts to sell all or substantially all of the Joint Facilities (other than User's Cahill/Lick Line) to a third party (other than those parties described in Section 3(a)), Owner may, at its sole cost and expense, file for permission from the ICC to abandon any Freight Service over the portion of the Joint Facilities (other than User's Cahill/Lick Line) that is to be sold. While User shall not object to such a filing, it shall be allowed to participate in the abandonment proceedings.

(b) In the event that Owner intends with reasonable certainty to commence construction of facilities on all or substantially all of the length of the Joint Facilities (other than User's Cahill/Lick Line) that are incompatible with the double mainline Freight Service, User shall consent to such diminished rights, provided that Owner shall have completed, at its sole cost and expense, the modification (whose plans and specifications have been approved by User) of the remaining single track (together with side track passing tracks and spur tracks) to be reasonably suitable for the volume and speed of the then existing Freight Service. Upon completion of such construction, User shall execute such documents as are reasonably necessary to extinguish the portion of the operating rights retained hereunder no longer required for Freight Service.

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(c) In the event that Owner demonstrates a reasonably certain need to commence construction on all or substantially all of the length of the Joint Facilities (including User's Cahill/Lick Line) of a transportation system that is a significant change in the method of delivery of Commuter Service which would be incompatible with Freight Service on the Joint Facilities (other than User's Cahill/Lick Line), Owner may, at its sole cost and expense, file no sooner than nine months prior to the commencement of such construction for permission from the ICC to abandon the Freight Service over the portion of the Joint Facilities (excluding User's Cahill/Lick Line) upon which the construction is to occur. User shall not object to or oppose such a filing; however, it shall be allowed to participate in the abandonment proceedings.

(d) In the event that (1) Owner notifies User in writing that it has permanently ceased to provide Commuter Service on all or substantially all of the Joint Facilities (other than User's Cahill/Lick Line) and within six months after such notice, no other public or private entity has evidenced a willingness to provide such Commute Service, and (2) if Owner has not filed an ICC application to abandon under subsection (a) above, and (3) User desires to continue to provide Freight Service over such portion, then, within one year after Owner's notice, User shall purchase, and Owner shall sell, all of the applicable Joint Facilities at Net Liquidation Value including Owner's interest in the underlying real property at the mileage pro rata share of the purchase price in the Sale Agreement attributable to the portion of the Joint Facilities being purchased. Should the parties be unable to agree on the sale price within after sixty days after Owner has advised User of its proposed sale price, either party may submit the matter to binding arbitration under this Agreement. If neither party submits the matter to arbitration by the thirtieth day after such sixty-day period, Owner's contractual right to require User to purchase hereunder shall lapse.

8.4 **Release:** Upon termination of this Agreement, or any part thereof, each party shall forever release and discharge the other party of and from any and all manner of obligations, claims, demands, causes of action, or suits which it might have, or which might subsequently accrue to it growing out of or in any manner connected with, directly or indirectly, the contractual obligations under this Agreement in the involved Trackage, provided, however, the aforesaid relinquishment, abandonment, surrender, renunciation, release, and discharge of the parties shall not in any case affect any of the rights and obligations of either party which may have accrued, or liabilities accrued or otherwise, which may have arisen prior to such termination or partial termination. Upon any partial termination of the Agreement, however the same may occur, the terms and conditions hereof shall continue and remain in full force and effect for the balance of the Joint Facilities.

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8.5 **Employees:** In the event of sale or of termination by abandonment pursuant to Section 8.3 hereof, Owner and User shall each be responsible for and shall bear labor claims of, and employee protection payable to, its own respective employees including any amounts that either Owner or User may be required to pay to its own respective employees pursuant to labor protective conditions imposed by the ICC.

8.6 **Limitation on Obligations:** Neither shall Owner have obligation to provide Freight or Intercity Passenger Service nor shall User have any obligation to provide Commuter Service. The abandonment of Freight or Intercity Passenger Service by User shall not create any obligation upon Owner to provide such Services, and the abandonment of Commuter Service by Owner shall not create any obligation upon User to provide such Service.

Section 9. MAINTENANCE

9.1 **Responsibility for Performance and Costs:** Owner shall physically perform the ordinary and capitalized maintenance on the Joint Facilities, (excluding User's Cahill/Lick Line) with the cost of such maintenance (other than for Exclusive Commute Trackage and Designated Freight Trackage) apportioned as described in Section 9.2 below. Owner shall physically perform the signal system maintenance on the New Coast Main. User shall pay the cost thereof with respect to the No. 1 Track, and the cost thereof with respect to User's Cahill/Lick Line shall be apportioned as provided in Section 9.2(b) below. Owner shall be responsible for all costs and expenses of the maintenance on Exclusive Commute Trackage except as provided in Sections 1.10 and 2.4 hereof. Owner shall perform the maintenance on Designated Freight Trackage, and all costs and expenses associated with such maintenance on Designated Freight Trackage shall be the responsibility of User except as provided in Sections 1.7 and 2.6 hereof. User shall either physically perform the maintenance on the New Coast Main (excluding signal system maintenance) or, upon written agreement of the parties, contract with Owner to perform such maintenance. All costs and expenses associated with such maintenance shall be apportioned pursuant to Section 9.2(b) hereof. No later than March 31 of each year, the party responsible for performing maintenance on any portion of the Joint Facilities (excluding User's Cahill/Lick Line) and the New Coast Main for which the other party has an obligation to pay or share the costs of hereunder will present such other party with a written estimated budget for costs and expenses for the applicable maintenance for the next-succeeding Fiscal Year. The party performing such maintenance may submit to the other party written proposed amendments, supplements or adjustments to said budget from time to time after submission of the initial estimated budget. Such initial estimated budget, and any amendments, supplements and adjustments shall be subject to the written consent of the

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receiving party which shall not be unreasonably withheld, conditioned or delayed. The party performing such maintenance, during such next succeeding Fiscal Year shall bill the other party monthly on an estimated actual cost basis (including Customary and Materials Additives) for the other party's share of such maintenance costs. If it appears to the billed party that the monthly billing deviates substantially from that projected in the estimated budget, the billed party may request a written explanation from the party performing maintenance as to the reason for such deviation and such party shall provide such written explanation within fifteen (15) days after receipt of the request. If the parties are in disagreement as to any such monthly billings or the amounts claimed for such maintenance, such disputes shall be resolved in accordance with Section 7 of this Agreement. At the end of each Fiscal Year there shall be an adjustment if billed costs deviate from actual costs. To the extent possible, the parties shall negotiate appropriate flat rates for such maintenance costs within twelve months of the Effective Date unless extended in writing by the parties.

9.2 **Apportionment of Costs:** Costs of ordinary and capitalized maintenance (but not the costs of Changes and/or Additions themselves) of the Peninsula Main Line (other than Exclusive Commute Trackage and Designated Freight Trackage) for the first four (4) years after the Effective Date shall be solely the responsibility of Owner. Otherwise, Owner and User will share ordinary maintenance costs and capitalized maintenance costs for the Joint Facilities (excluding Exclusive Commute Trackage and Designated Freight Trackage) on the basis of the SFGTF, for which purpose User shall provide Owner with required data regarding User's Freight and Intercity Passenger Service operated on the Joint Facilities within ninety (90) days after the end of each Fiscal Year of this Agreement. Owner and User shall each respectively bear responsibility for the costs attributable to its respective Operator(s) and other entities acting on its behalf and for its account. The SFGTF shall be applied to the traffic on said Joint Facilities as follows:

(a) On the Peninsula Main Line. The SFGTF will be applied with Owner as the "dominant user." However, capital expenditures which are unique for Commuter Service only (e.g., electrification or station platforms) will be paid solely by Owner and not included in the SFGTF. Similarly, capital expenditures which are unique for Freight and Intercity Passenger Service (e.g., a gauntlet track in tunnels for oversized intermodal traffic) will be paid solely by User and not included in the SFGTF.

(b) On User's Cahill/Lick Line. The SFGTF will be applied with User as the "dominant user" until the total number of Owner's Trains in Gilroy Commuter Service in any Fiscal Year exceeds the number of User's Trains in Freight and Intercity Passenger Service in that Fiscal Year, in which case Owner will

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become the "dominant user" as defined in the SFGTF for that Fiscal Year. Thereafter, the determination as to who is the "dominant user" shall be made for each Fiscal Year, with the party having the greater number of Trains designated as the "dominant user" for the applicable Fiscal Year. The same provisions prevail for applying capital expenditures which are unique to Gilroy Commuter Service or unique to Freight and Intercity Passenger Service to the SFGTF as stated in Section 9.2(a).

(c) On the main track portion of Exclusive Commute Trackage between Cahill Yard and Lick. During any period that User is provided access to and use of such Trackage pursuant to Section 2.9 hereof the SFGTF will be applied in the same manner as provided in Subsection 9.2(b) hereof, except that Owner shall be the initial "dominant user" instead of User, and the same conditions will prevail for applying capital expenditures which are unique to Commuter Service or unique to Freight and Intercity Passenger Service to the SFGTF as stated in Section 9.2(a).

9.3 **Level of Maintenance:** The Joint Facilities (other than Exclusive Commute Trackage) shall be maintained at the levels necessary to accommodate User's present and future Freight and Intercity Passenger Train operations, to allow User to maintain competitive service levels. The maintenance of Designated Freight Trackage shall be pursuant to an annual maintenance program mutually agreed by the parties. User shall maintain User's Cahill/Lick Line to a minimum of the existing condition as reflected in train speeds shown in User's Timetables, General Orders and Track Bulletins in effect as of the date of this Agreement, as attached hereto as Exhibit F. If Owner makes Changes and/or Additions to the User's Cahill/Lick Line in accordance with Section 10.8 below, User shall maintain User's Cahill/Lick Line as provided in Section 10.8 below.

9.4 **Protection of Operations:** Owner further agrees that maintenance and Changes and/or Additions activities affecting the Joint Facilities (excluding User's Cahill/Lick Line) shall not be scheduled to unreasonably delay or impair User's rights under Section 4.3 to provide Freight or Intercity Passenger Service on the Joint Facilities (excluding User's Cahill/Lick Line). User shall be given the same advance notice of maintenance plans and schedules as is provided to Owner's personnel. User further agrees that maintenance and Changes and/or Additions activities affecting User's Cahill/Lick Line shall not be scheduled to unreasonably delay or impair Owner's rights under Section 4.5 to provide Gilroy Commuter Service on User's Cahill/Lick Line. Owner shall be given the same advance notice of maintenance plans as is provided to User's personnel.

9.5 **Assumption of Maintenance:** In the event Owner becomes incapable of adequately performing maintenance functions hereunder for Freight and Intercity Passenger Service, arrangements will be

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made for the prompt and orderly transfer of such functions to User. In the event User is physically performing maintenance on User's Cahill/Lick Line and becomes incapable of adequately performing maintenance functions hereunder for Gilroy Commuter Service, arrangements will be made for the prompt and orderly transfer of such functions to Owner.

Section 10. CAPITAL IMPROVEMENTS

10.1 **Owner Responsibility:** Owner shall provide, at its sole cost and expense, or reimburse User for the following Changes and/or Additions: (a) upgrading the present No. 1 Track to main line standards to not less than current Federal Railroad Administration Class 4 for the segment from Santa Clara Jct. at or near Milepost 44.0 to the magnetic north end of Cahill Yard at or near Milepost 46.75; (b) installation of a bidirectional centralized traffic control system for the No. 1 Track; and (c) all Changes and/or Additions on the Joint Facilities, excluding User's Cahill/Lick Line, (including but not limited to grade separations on the Peninsula Main Line) other than those Changes and/or Additions subject to Section 10.2 or Section 10.3. The Changes and/or Additions described in (a) and (b) above, which shall be owned by Owner, are set forth in Exhibit G and shall be completed within twenty-four (24) months of the Effective Date subject to the provisions of Section 2.13 hereof. The costs payable by Owner to User for the Changes and/or Additions described in (a) and (b) above shall be $1,980,000. Payment shall be due and payable by Owner upon the later of: (1) the ninetieth (90th) day after completion of such Changes and/or Additions; or (2) the second anniversary of the Effective Date. If payment is not made by Owner within the period above specified, Owner will pay to User interest on the amounts due at a rate equal to the interest rate paid by User during the then current applicable period to its major bank lenders under its principal financing facility. Such interest shall be payable monthly in arrears and shall be due on the first day of each calendar month with the final interest payment due on the day that the remaining principal balance is paid in full. Notwithstanding anything to the contrary above, the full amount of principal and interest due and payable by Owner hereunder shall be paid not later than forty-eight (48) months after the Effective Date.

10.2 **User Responsibility:** User shall bear the costs of Changes and/or Additions on Joint Facilities (excluding User's Cahill/Lick Line), including Designated Freight Trackage, which User has requested to be effected and which are not used in connection with Commuter Service.

10.3 **Shared Responsibility:** The cost of Changes and/or Additions on the Joint Facilities (excluding User's Cahill/Lick

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Line) which User has requested and, based thereon, which Owner has agreed to undertake and has actually undertaken and which are used for both User's and Owner's operations shall be shared on a basis to be agreed by the parties.

10.4 **Grade Separations and Crossing:** Notwithstanding any other provisions of Section 10 of this Agreement (other than Section 10.9), the cost of new and upgraded grade separations and new or upgraded pedestrian or vehicular road crossings at grade on the Santa Clara/Lick Line and the New Coast Main (but not including the cost of maintenance or capitalized maintenance of any of the foregoing) shall be borne by the parties as follows:

(a) **Owner Responsibility:** Owner shall be solely responsible for the cost and expense of those separations and crossings covered hereunder which (i) it has instituted and undertaken for its benefit and which were not requested by User, (ii) Owner has requested, and based thereon, User has actually undertaken, or (iii) were requested, required or funded by any other party and which Owner has instigated, induced, actively and substantially supported, or solely caused.

(b) **User Responsibility:** User shall be solely responsible for the cost and expense of those separations and crossings covered hereunder which (i) it has instituted and undertaken for its benefit and which were not requested by Owner, (ii) User has requested, and based thereon, Owner has actually undertaken, or (iii) were requested, required or funded by any other party and which User has instigated, induced, actively and substantially supported, or solely caused.

(c) **Shared Responsibility:** Owner and User shall share the costs and expenses for all other grade separations and crossings not subject to Subsections (a) and (b) above on the basis of the number of Trains of each party operated over the applicable grade separation or crossing during the twelve calendar month period immediately preceding the approval of the final plans for construction of such grade separation or crossing.

(d) **Identity of Parties:** For purposes of this Section 10.4, Owner shall include any one or more of Owner's member agencies, its Operator(s) or other entities acting on Owner's behalf or for its account, and its respective successors or assigns; and User shall include User's Operator(s) or other entities acting on User's behalf and for its account and its respective successors and assigns.

10.5 **User's Improvements:** Changes and/or Additions which are User's responsibility pursuant to Section 10.2 (if it decides to make such improvements) shall include, but are not limited to, the following: (i) two storage tracks and turnouts between Bayshore at Milepost 4.9 and Brisbane at Milepost 7.1, on the

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westerly side of and no less than twenty (20) feet from Owner's eastward main track and trackage necessary to construct the wye and tail tracks at Brisbane and Bayshore (however, the twenty (20) foot space shall not be used for motor vehicles); (ii) a gauntlet track from the north end of Tunnel No. 3 (at Milepost 3.1) to the south end of Tunnel No. 4 (at Milepost 5.3) along with an interlocking signal protection system; (iii) four (4) new power operated crossovers between Owner's main tracks in connection with the construction of (i) and (ii) above; and, (iv) upon the approval of Owner (which shall not be unreasonably withheld), such additional support trackage and other facilities to meet User's Freight Service needs. Such construction, reconstruction, or use shall not unreasonably interfere with Owner's Commuter Service and the completion of the above projects shall not result in the degradation of the track and signal system of the Joint Facilities.

10.6 **User Requests:** Engineering and design plans for the construction of any Changes and/or Additions requested by User on Joint Facilities (other than User's Cahill/Lick Line) and on the New Coast Main (but only to the extent and at the location diverging from or connecting to those portions of the Joint Facilities other than User's Cahill/Lick Line) must be submitted to and approved by Owner prior to any construction. Owner's approval for such construction shall not be unreasonably withheld, conditioned or delayed.

10.7 **Caltrans Improvements:** Owner will arrange for Caltrans to waive any and all rights to receive payment for unamortized capital improvements on the Joint Facilities which Owner has funded and Owner shall continue the State of California's current participation in capital improvement programs without User's participation.

10.8 **Changes and/or Additions to User's Cahill/Lick Line:** Owner shall have the right to request Changes and/or Additions to User's Cahill/Lick Line. Any such Changes and/or Additions requested by Owner shall be subject to the approval of User (which shall not be unreasonably withheld, conditioned or delayed), and shall be at Owner's sole cost and expense. If Owner and User agree to the Changes and/or Additions, they shall further agree in writing as to the nature of such Changes and/or Additions, as to the level of utility to the line effected by the Changes and/or Additions, and the consequent level of maintenance required under Section 9.3, above, by reason of such Changes and/or Additions. Any Changes and/or Additions to User's Cahill/Lick Line effected by User pursuant to its rights under this Agreement shall be at User's sole cost and expense. The parties may, but are not required to, agree on a cost sharing for Changes and/or Additions to User's Cahill/Lick Line that are mutually beneficial.

10.9 **Necessary Changes and/or Additions:** Notwithstanding any other provisions of Section 10 of this

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Agreement, if Changes and/or Additions are determined to be necessary to reinstate Service or are then currently necessary to maintain the integrity of the Trackage or Track Structure for its then current utility to both parties on User's Cahill/Lick Line, on the Trackage over which User's Cahill/Lick Line is situated, or, during any period that User is provided access to and use of such Trackage pursuant to Section 2.9 hereof, the main Trackage portion of Exclusive Commuter Trackage between Cahill Yard and Lick, the party owning the element of the affected Trackage or Track Structure ("responsible party") shall be responsible for undertaking the necessary Changes and/or Additions and Owner and User shall share the costs of such Changes and/or Additions on a mutually agreeable basis taking into account the benefits to each party derived from the continued use of the Trackage or Track Structure. (Notwithstanding use of the SFGTF elsewhere in this Agreement, there shall be no presumption that the SFGTF is the appropriate basis for allocating costs under this Section 10.9 in any given situation.) Changes and/or Additions effected pursuant to this Section shall be subject to the procedures set forth in Subsections (a) through (e) below.

(a) In the event of an occurrence (other than that for which a party is liable under Section 6) resulting in (i) cessation or interruption of Service and damage to the Trackage or Track Structure, and the costs of Changes and/or Additions to reinstate Service and to bring the Trackage and Track Structure to the then current level of utility is in excess of $15,000,000, or (ii) significant disruption of Service and damage to the Trackage or Track Structure, and the costs of Changes and/or Additions to reinstate Service and to bring the Trackage and Track Structure to the then current level of utility is in excess of $5,000,000 for the first twenty (20) years after the Effective Date and $10,000,000 thereafter, the responsible party will elect whether to make the necessary Changes and/or Additions to reinstate Service and to bring the line to its then current level of utility. If the responsible party elects to abandon Service in lieu thereof, it will notify the other party, in which case the notified party will have the option to acquire the applicable Trackage or Track Structure at a value to be agreed upon; and, if the parties cannot agree on the value, the issue of the value will be submitted to arbitration pursuant to Section 7 hereof. If the responsible party elects to effect the Changes and/or Additions, it will so notify the other party, and the notified party will have the option of agreeing to share the costs of such Changes and/or Additions on the basis described above or to abandon its Service on the affected Trackage or Track Structure. If either party elects to abandon Service pursuant to this Subsection and is prevented from such abandonment by regulatory authority, it will share the costs of Changes and/or Additions with the party making any Changes and/or Additions under this Subsection on the basis described above.

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(b) In the event of an occurrence (other than that for which a party is liable under Section 6) resulting in (i) cessation or interruption of Service and damage to the Trackage or Track Structure, and the costs of Changes and/or Additions to reinstate Service and to bring the Trackage and Track Structure to the then current level of utility does not exceed $15,000,000, or (ii) significant disruption in service and damage to the Trackage or Track Structure, and the costs of Changes and/or Additions to reinstate Service and bring the Trackage and Track Structure to the then current level of utility does not exceed $5,000,000 for the first twenty (20) years after the Effective Date and $10,000,000 thereafter, the responsible party shall notify the other party and shall immediately undertake such Changes and/or Additions. The cost of such Changes and/or Additions shall be shared on the basis described above.

(c) In the event that either party determines that Changes and/or Additions are then currently necessary to maintain the integrity of the Trackage or Track Structure at its then current level of utility and Service thereover, such party shall notify the other party of its decision. If the notified party agrees with said decision, the responsible party shall undertake the necessary Changes and/or Additions and the costs of such Changes and/or Additions shall be shared on the basis described above. If the notified party does not agree with the notifying party's decision, the issue of whether the Changes and/or Additions are then currently necessary to maintain the integrity of the Trackage or Track Structure and Service thereover shall be arbitrated pursuant to Section 7 hereof. If it is determined that such Changes and/or Additions are then currently necessary, the costs of such Changes and/or Additions shall be shared on the basis described above.

(d) If the Changes and/or Additions subject to Subsections (a), (b) or (c) above result in Trackage or Track Structure of greater utility than that in place prior to such Changes and/or Additions, the incremental costs thereof, if any, attributable to such greater utility shall be borne as follows:

(i) If the increased utility results from the fact that the particular Change and/or Addition resulting in such increased utility was required by then current standards imposed by law, regulations or applicable codes in order to restore the Track or Track Structure to the level of utility existing prior to effecting the Change and/or Addition, the incremental costs shall be borne in the manner provided in Subsections (a), (b) or (c) above, whichever is applicable.

(ii) If the increased utility was requested by one of the parties, or effected by the party for its benefit, but otherwise would not have been required by then current standards to restore the Track Structure or Trackage to the level of utility

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existing prior to the Change and/or Addition, then the incremental cost shall be borne by the party requesting or effecting the increased utility.

(e) In the event that the parties cannot agree on their respective share of costs for Changes and/or Additions described in (a), (b), and (c) above, the matter will be submitted to arbitration pursuant to Section 7 hereof. A decision from the arbitrator must be rendered prior to the commencement of any Changes and/or Additions effected pursuant to Subsection (c) hereof.

Section 11. MISCELLANEOUS

11.1 **Other Costs:** Costs of operations and administration will be borne by the party incurring such costs (unless one party's duty to perform the operations and to bear the costs thereof under the terms of this Agreement was undertaken by the other party pursuant to this Agreement because of the first party's failure to perform its obligations hereunder in which event the failing party shall reimburse the other party for such costs) and any costs which cannot be identified as a cost solely applicable to one party will be apportioned between the parties on the basis of the SFGTF applied in the same manner as in Section 9.2.

11.2 **Force Majeure:** Neither party shall be liable to the other in damages nor shall a default be deemed to have occurred, and each party shall be excused from performance of any of its obligations hereunder, except obligations involving the payment hereunder of money to the other party or to a third party, during the time when such non-performance is occasioned by fire, earthquake, flood, explosion, wreck, casualty, strike, unavoidable accident, riot, insurrection, civil disturbance, act of public enemy, embargo, war, act of God, inability to obtain labor, materials or supplies, or any other similar cause beyond the party's reasonable control; provided, that if either party suffers a work stoppage due to a labor dispute, such party shall make such reasonable efforts, if practicable, to staff its operations so as to minimize disruptions to the Service provided by the other party on the Joint Facilities.

11.3 **Billing:** Billing shall be accomplished on the basis of data contained in a billing form mutually agreed to between the parties. Such billing forms shall contain sufficient detail to permit computation of payments to be made hereunder. Unless otherwise specifically provided herein, billing shall be prepared in accordance with the schedules of the rules, Customary Additives, Materials Additives, material prices and equipment rental rates as agreed upon by the chief accounting officers of the parties hereto (or their designees) from time to time. User shall pay to Owner at

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the office of the Treasurer of Owner, or at such other location as Owner may from time to time designate, all the compensation and charges of every name and nature which, in and by this Agreement User is required to pay in lawful money of the United States, within forty-five (45) days after the rendering of bills therefor by the Owner. Bills shall contain a statement of the amount due on account of the expenses incurred and services rendered during the billing period.

Errors or disputed items in any bill (including disputes arising under Section 9.1 but excluding disputes arising under Section 10.9) shall not be deemed a valid excuse for delaying payment, but shall be paid subject to subsequent adjustment; provided, no exception to any bill shall be honored, recognized or considered if filed after the expiration of three years from the last day of the calendar month during which the bill is rendered and no bill shall be rendered later than three years (i) after the last day of the calendar month in which the expense covered thereby is incurred, or (ii) if in connection with a project for which a Roadway Completion Report (as that term is presently understood by the railroad industry) is required, three years after the last day of the calendar month in which the Roadway Completion Report is made covering such project, or (iii) in the case of claims disputed as to amount or liability, after the amount is settled and/or the liability is established. This provision shall not limit the retroactive adjustment of billing made pursuant to: (a) exception taken to original accounting by or under authority of the ICC or (b) retroactive adjustment of wage rates and settlement of wage claims.

So much of the books, accounts and records of each party hereto as are related to the subject matter of this Agreement shall at all reasonable times be open to inspection by the authorized representatives and agents of the parties hereto and by the Auditor General of the State of California pursuant to Government Code Section 10532. If work relating to this Agreement is funded in whole or in part by a federal grant, the Comptroller General of the United States and authorized representatives of the federal agency furnishing the grant shall have the right to examine and audit such books, accounts and records in accordance with applicable federal laws and regulations.

Should any payment become payable by Owner to User under this Agreement, the above provisions of this Section shall apply with User as the billing party and Owner as the paying party.

In the event that either party fails to make any payment required to be made to the other party in accordance with the provisions of this Agreement by the date upon which it is due, interest shall accrue from the due date until payment is made, at the Federal Discount Rate in effect on the due date plus three (3) percent; provided, however, that no interest shall be due and

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payable on any amounts in dispute which are determined, either by subsequent review or by arbitration, to be not validly due hereunder.

11.4 **Notices:** All notices and other communications under this Agreement shall be in writing and shall be deemed to have been duly given (i) on the date of delivery, if delivered personally to the party to whom notice is given, or if made by telecopy directed to the party to whom notice is to be given at the telecopy number listed below, or (ii) on receipt, if mailed to the party to whom notice is to be given by registered or certified mail, return receipt requested, postage prepaid and properly addressed as follows:

If intended for Owner:

Peninsula Corridor Joint Powers Board
1250 San Carlos Avenue
San Carlos, CA 94070-1306
Attention: Gerald T. Haugh
Phone No.: 415-508-6221
Telecopy No.: 415-508-0281

With a copy to:

Hanson, Bridgett, Marcus, Vlahos & Rudy
333 Market Street, Suite 2300
San Francisco, CA 94105
Attention: David J. Miller
Phone No.: 415-777-3200
Telecopy No.: 415-541-9474

If intended for User:

Executive Vice President-Operations
Southern Pacific Transportation Company
One Market Plaza
San Francisco, CA 94105
Phone No.: 415-541-2125
Telecopy No. 415-541-1829

With a copy to:

Director-Contracts & Joint Facilities
Southern Pacific Transportation Company
One Market Plaza, Room 1004-P
San Francisco, CA 94105
Phone No.: 415-541-2772
Telecopy No. 415-541-1802

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And to:

Vice President & General Counsel
Southern Pacific Transportation Company
One Market Plaza
San Francisco, CA 94105
Phone No.: 415-541-1781
Telecopy No. 415-495-5436

A party may change its person designated to receive notice, its telecopy number, or its address from time to time by giving notice to the other party in accordance with the procedures set forth in this Section 11.4.

11.5 **Preferences:** Except as hereafter determined by the mutual agreement of the parties, neither of them shall seek in any administrative, legislative or judicial proceeding or otherwise to obtain rights in the use of the properties subject to this Agreement in excess of those provided to it, or seek to diminish such rights provided to the other. Notwithstanding the provisions of Section 7, the parties shall have recourse to the courts or any governmental agency having jurisdiction in the event of a violation of this Section 11.5, and, in addition to any available remedies for damages, the remedy of specific enforcement shall be available with respect thereto.

11.6 **Headings:** The section and subsection headings in this Agreement are for convenience only and shall not be used in its interpretation or considered part of this Agreement.

11.7 **Recording:** Either party may, at its sole election and expense, record this Agreement with the appropriate governmental authorities. The parties agree that, should it be necessary to modify or amend any property description for such recording purposes, they shall cooperate in making said modifications or amendments.

11.8 **Entire Agreement:** This Agreement and its Exhibits together with the Sale Agreement represent the entire Agreement between Owner and User concerning the terms of the trackage rights retained and confirmed hereby.

11.9 **Amendments:** No modification, addition or amendment to this Agreement shall be effective unless and until such modification, addition or amendment is reduced to a writing executed by authorized officers or agents of each party and delivered to the other party.

11.10 **Not For The Benefit Of Others:** This Agreement and each and every provision herein is for the exclusive benefit of the parties hereto and not for the benefit of any third party. Nothing herein shall be construed to create or increase any right in any

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third person to recover by way of damages or otherwise against any of the parties hereto.

11.11 **Access:** Each party, its employees, agents, and designees, shall have access to the Joint Facilities and to the operating and maintenance records of the other concerning the movement of Trains or Equipment on and maintenance of the Joint Facilities for the purpose of monitoring conformance to the principles and standards expressed in this Agreement.

11.12 **Effective Date:** The Effective Date of this Agreement shall be contingent upon receipt of all necessary regulatory approvals or exemptions and, assuming such receipt, shall be the earlier of (i) the date that an Operator commences Commuter Service for Owner or (ii) June 30, 1992; provided, however, that portion of this Agreement involving Bridge Trackage Rights, Gilroy Commuter Service and the use by Owner of User's Cahill/Lick Line in connection therewith (including any rights of User pursuant to Section 2.9 hereof), shall be effective only as of the "Effective Date" of the Lick/Gilroy Trackage Rights Agreement (as said term is defined in such Agreement). Any necessary regulatory approvals or exemptions for such Bridge Trackage Rights, Gilroy Commuter Service, and the use of User's Cahill/Lick Line shall be sought concurrent with any necessary approvals or exemptions of the Lick/Gilroy Trackage Rights Agreement. During that period between receipt of necessary regulatory approvals or exemptions and the Effective Date, User shall have the right to conduct Freight and Intercity Passenger Service and operations in support thereof over the Joint Facilities (excluding User's Cahill/Lick Line) but only in the same manner and to the same extent as providedas of the date hereof. User agrees during such period to indemnify and defend Owner against all liability in connection with User's Freight and Intercity Passenger Service except to the extent caused by Owner's willful or negligent acts or omissions. During the interim period, User shall provide Commuter Service for Owner as interim Operator pursuant to its service contract with the State of California Department of Transportation.

11.13 **Track Agreements.** As a condition precedent to the effectiveness of this Agreement, User shall deliver to Owner documentation satisfactory to Owner, assigning to Owner as an additional beneficiary, User's rights and benefits of the indemnity provisions contained in the track agreements identified in Exhibit H. User will cooperate with Owner to jointly call on parties with whom User has track agreements to have such parties assign the indemnity provisions of such agreements directly to Owner.

11.14 **Sale Agreement Controlling.** This Agreement is entered into by the parties pursuant to and in furtherance of the Sale Agreement. In the event that there are terms in this Agreement which are inconsistent with the terms of the Sale Agreement, the terms of the Sale Agreement shall govern. Except as may be

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otherwise specifically stated herein, nothing contained in this Agreement shall be construed to limit or otherwise modify the rights and obligations of the parties under the Sale Agreement.

11.15 **Survival of Rights.** The rights of a party under this Agreement shall survive the bankruptcy or other insolvency of the other party to the maximum extent permitted by law.

11.16 **Quitclaim of User's Easement.** From time to time, Owner may desire to develop portions of the Joint Facilities (excluding the New Coast Main) which are not being used by User for Freight or Intercity Passenger Service. In connection with such developments, Owner may desire User to release its easement with respect to specified portions of the Joint Facilities (excluding the New Coast Main) in order to permit such development. Any such quitclaim shall be subject to the procedures set forth below and shall be further subject to any necessary regulatory approvals or exemptions:

(a) At any time after the Effective Date, and from time to time thereafter, Owner may request User to release a portion of its railroad easement. User shall release such easement upon the following terms and conditions:

Each request (a "Request") shall be in writing and shall contain (i) a legal description of the portion of the Joint Facilities (excluding the New Coast Main) to be released (the "Requested Portion"); (ii) a survey of the Requested Portion prepared by an engineer licensed by the State of California and showing the location of all railroad lines within 25 feet of the Requested Portion; (iii) a reasonably detailed description of the improvements to be constructed by Owner on the Requested Portion; (iv) to the extent available, the latest plans and specifications, conceptual drawings, renderings or similar graphic material regarding the proposed development; (v) an estimate of the costs of the development and the manner in which funds therefor will be provided; and (vi) the proposed times for commencement and completion of the development.

(b) Within 60 days after the receipt of the information requested by Subsection (a) above, User will, except as set forth in Subsection (c) below, execute and deliver to Owner a quitclaim deed in form and substance reasonably satisfactory to Owner releasing the Requested Portion from User's easement. Such quitclaim deed shall reserve to User any fiber optic easement executed pursuant to Section 7.1(a) of the Sale Agreement.

(c) User shall not be required to execute or deliver such quitclaim deed if (i) any part of the Requested Portion lies within 25 feet of any property (A) then used by User for its Freight or Intercity Passenger Service operations, or (B) for which User has a reasonable certainty of using for such purposes, as

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further described below, or (ii) Owner's proposed development will not be commenced within twelve (12) months of the Request. The provisions of Subsection (c)(i)(B) hereof shall not apply to Trackage which has not been used for a continuous five-year period and is thereby subject to the provisions of Section 2.17.

(d) If within 60 days after receiving a Request User determines that under Subsection (c) it is not required to execute and deliver a quitclaim deed for a Requested Parcel, User shall, within such period, notify Owner of such fact in writing stating the reason therefor (a "Refusal Notice"). If User's reason for refusing to execute and deliver a quitclaim deed is based upon the fact that User has a reasonable certainty that all or a portion of the Requested Parcel will be used for its Freight or Intercity Passenger Service operations, it shall provide Owner with (i) a reasonably detailed statement of such planned use, (ii) the most recent plans or specifications, conceptual drawings or other graphic materials with respect to such planned use, (iii) an estimate of the cost of constructing any improvements needed for such planned use, (iv) a statement of the source of funds for such planned use, and (e) the proposed time for commencement of the planned use. The provisions of the preceding sentence shall not apply to Trackage which has not been used for a continuous five-year period and is thereby subject to the provisions of Section 2.17. Any planned use of the property by User for its Freight or Intercity Passenger Service operations will not be considered a reasonably certain planned use, if it is unlikely that construction of the improvements therefor will not commence within twelve (12) months after the Refusal Notice.

(e) If Owner disagrees with User's determination that it is not required to deliver a quitclaim deed with respect to any request, Owner may submit such matter to arbitration pursuant to Section 7 hereof within 60 days after receiving a Refusal Notice.

11.17 **Counterparts:** This Agreement may be executed in any number of counterparts, each of which shall be and shall be taken to be an original, and all such counterparts shall together constitute one and the same instrument.

11.18 **User's Separate Property:** Trackage and/or other facilities owned by User that are located on real property owned by User shall not be part of the Designated Freight Trackage, Joint Facilities, or Exclusive Commute Trackage.

Comment Letter O012 - Continued

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IN WITNESS WHEREOF, Owner and User have executed this Agreement as of the day and year first written above.

PENINSULA CORRIDOR STUDY
JOINT POWERS BOARD

By: _____
Name:
Title:

Approved as to Form:
Hanson, Bridgett, Marcus, Vlahos and Rudy
by John J. Vlahos

SOUTHERN PACIFIC
TRANSPORTATION COMPANY

By: _____
Name:
Title:

Approved as to Form:

_____

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O012-14

Owner User

IN WITNESS WHEREOF, ~~SPB~~ and ~~SPT~~ have executed this Agreement as of the day and year first written above.

PENINSULA CORRIDOR STUDY
JOINT POWERS BOARD

By: _____
Name:
Title:

Approved as to Form:

_____

SOUTHERN PACIFIC
TRANSPORTATION COMPANY

By: _____
Name: Robert F. Starzel
Title: Vice Chairman

Approved as to Form:

Louis P. Warchot

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O012-16

Memorandum

smart mobility

To: David Schonbrunn, TRANSDEF
From: Norm Marshall
Subject: Traffic Impacts of Narrowing Monterey Highway
Date: April 26, 2010

The revised Pacheco Pass alignment of the proposed High Speed Train requires that a section of Monterey Highway be reduced in width from 6 lanes to 4 lanes. The revised Environmental Impact Report (EIR)[1] presents level-of-service calculations and concludes that with the narrowing, "traffic congestion is projected to increase slightly in both directions." (p. 2-11) The analysis presented is woefully inadequate because the impacts of the narrowing fall primarily on other roadways, and these congestion impacts on other roadways are not even mentioned, and certainly not analyzed. The EIR also fails to evaluate congestion impacts during other time periods, particularly during the weekday morning peak hour.

The level of service information provided in the EIR is limited to that given in the table below.

Table 2-4
Traffic Conditions on Monterey Highway With and Without the Project During Evening Peak Period (Year 2035)

MONTEREY HIGHWAY SEGMENT		Northbound						Southbound					
		6 LANES – BASE CASE			4 LANES – WITH HST PROJECT			6 LANES – BASE CASE			4 LANES – WITH HST PROJECT		
From	To	Peak Hr Vol	V/C	LOS	Peak Hr Vol	V/C	LOS	Peak Hr Vol	V/C	LOS	Peak Hr Vol	V/C	LOS
Southside	Capitol	1,791	0.629	B	1,490	0.784	C	2,753	0.966	E	1,880	0.989	E
Capitol	Senter	2,101	0.737	C	1,504	0.792	C	2,894	1.015	F	1,907	1.004	F
Senter	Branham	2,114	0.742	C	1,593	0.839	D	2,790	0.979	E	1,853	0.975	E
Branham	Chynoweth	2,330	0.818	D	1,746	0.919	E	2,727	0.957	E	1,835	0.966	E
Chynoweth	Blossom Hill	2,574	0.903	E	1,947	1.025	F	2,637	0.925	E	1,885	0.992	E
Blossom Hill	Bernal	1,807	0.623	B	2,004	0.691	B	3,252	1.121	F	3,019	1.041	F
Bernal	Metcalf	3,081	1.027	F	3,153	1.051	F	3,148	1.049	F	2,919	0.973	E
Metcalf	Bailey	2,800	0.933	E	2,869	0.956	E	3,071	1.024	F	2,846	0.949	E

Source: San Jose Department of Transportation 2010.
Peak Hr Vol = peak hour volume.
V/C = volume-to-capacity ratio.

From EIR p 2-11.

Table 2-4 does not include capacity numbers. However, capacity can be approximated from the traffic volumes and volume-to-capacity ("V/C") ratios shown. I was able to obtain the capacity values precisely from model files provided by the City of San Jose. The assumed capacity north of Blossom Hill is assumed to be 950 vehicles per lane per direction, or 2850 vehicles per hour per direction in the 6 lanes *Base Case* and 1900 vehicles per direction in the 4 lanes *with HST Project* case. The model assumes 4

[1] Bay Area to Central Valley High-Speed Train Revised Draft Program Environmental Impact Report Material. California High Speed Rail Authority, March 2010. http://www.cahighspeedrail.ca.gov/library.asp?p=9275 (captured 4/8/10)

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lanes south of Blossom Hill in both scenarios except that the capacity per lane is assumed to be 1450 vehicles per hour, or a capacity of 2900 vehicles per direction per hour.

In the text above Table 2-4, the EIR states:

> As discussed above in the Affected Environment, Monterey Highway in the San Jose to Central Valley Corridor is six lanes wide from Southside Drive to Blossom Hill Road, and four lanes wide south of Blossom Hill Road. For the HST project, segments of Monterey Highway from Umbarger Road to Metcalf Road (near Bailey Road) are proposed to be narrowed from six lanes to four lanes to provide a cost-effective right-of-way corridor for HST by minimizing property acquisition along the HST alignment. (EIR, p. 2-11)

This excerpt is contradictory as it describes Monterey Highway south of Blossom Hill Road to be four lanes without the project and also describes it as being narrowed with the project to four lanes. It is possible that the capacity of the four-lane section actually is higher than the capacity of the six-lane section if the four-lane section is more of an expressway with extremely limited access. However, these assumptions should be justified in the EIR. If there is narrowing that would affect capacity south of Blossom Hill Road, the effects of this narrowing were not modeled.

In the forecast conditions for the 2035 weekday evening peak hour, the southbound volumes are higher than the northbound volumes, with the highest modeled volume for the section proposed to be narrowed from 6 lanes to 4 being between Capitol and Senter. In the 6-lane Base Case, the modeled volume is 2,894. The assumed hourly capacity is 950 vehicles per lane, so that the total directional capacity is 2,850 vehicles per hour. The volume-to-capacity ratio is 2,894/2,850 = 1.015. By definition, a volume-to-capacity ratio of greater than 1.0 represents failing level-of-service "F" conditions. In the 4-lane scenario, the modeled volume drops by 987 vehicles per hour or slightly more than the loss of capacity (950 vehicles per hour). The volume-to-capacity ratio is 1.004 (again level-of-service "F").

In 2035, much of the roadway network for the Base Case in this area is modeled as operating at level-of-service F as shown in Figure 1.[2] There is severe congestion forecast for the major freeways surrounding the proposed narrowing, including the Bayshore Freeway, the West Valley Freeway, the Guadalupe Parkway and I-280.

[2] This and subsequent graphics display information derived from Cube Voyager model files provided by the City of San Jose Department of Transportation.

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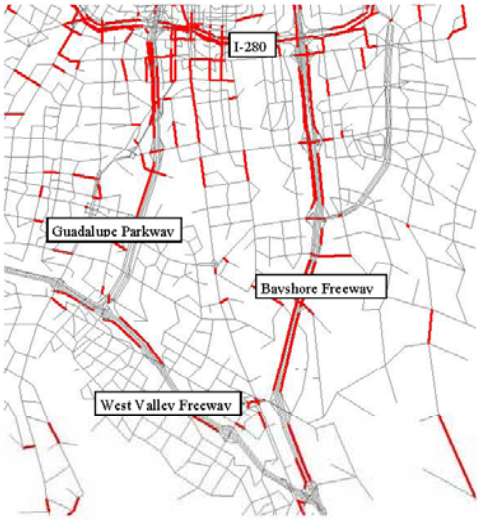
Figure 1: Base Case 2035 Roadways Forecast to Operate at LOS F in the PM Peak Hour



The EIR fails to consider the impacts of the proposed narrowing on any of these congested roadways. Whenever a loss of roadway capacity is considered, both the general public and local traffic engineers always are concerned about traffic diversion onto other streets and roads. The EIR's lack of analysis of such diversion is a fatal flaw. It is difficult to imagine how addressing such an obvious concern could have been left out of the documentation except through intentional neglect.

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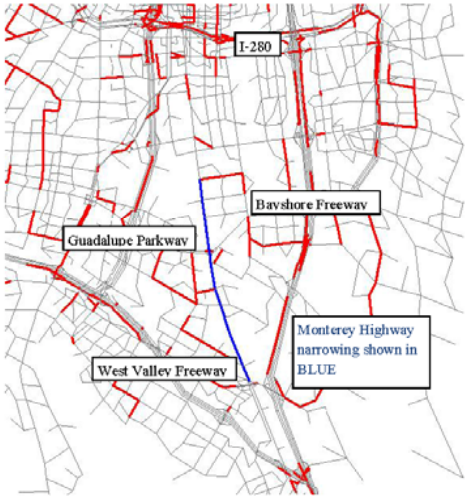
In the modeling done by the City of San Jose, the same vehicle trip table was assigned to both the Base Case and the HSR Project scenario. [3] Therefore, every single one of the 987 vehicles per hour that are subtracted from the Monterey Highway due to the narrowing are shifted to parallel routes. Figure 2 shows roadways where the modeled traffic increases by 100 or more vehicles in at least one direction during the afternoon peak hour due to the narrowing of Monterey Highway. The roadways with these modeled increases include the major freeways surrounding the proposed narrowing that are shown in Figure 1 to be operating at the failed level-of-service F in the Base Case. Adding traffic to these roadways as a result of the widening will make already unacceptable traffic conditions even worse.

Figure 2: 2035 Roadways with Traffic Increases of 100 or More in at Least One Direction Due to Narrowing



[3] "For the purposes of evaluating traffic impacts on Monterey Road, the 2035 highway network and the 2035 PM peak hour trip table are\obtained from VTA's 2035 TDF." From "HSR Monterey Corridor Modeling Methodology", City of San Jose Department of Transportation.

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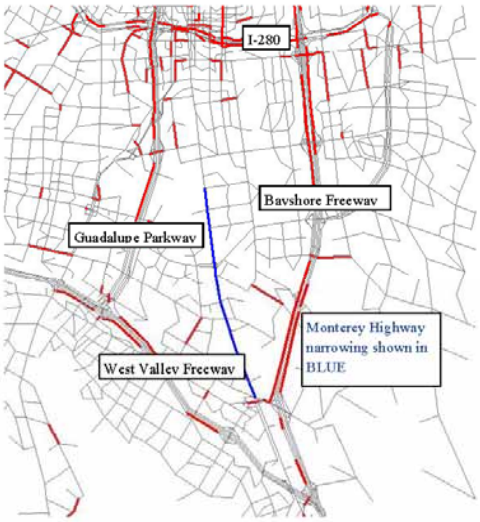
Figure 3 combines level-of-service F conditions with traffic increases that would result from the narrowing. Specifically, it shows roadways that are modeled to operate at level-of-service F during the afternoon peak with the HSR project and where traffic volumes would be higher with the narrowing than in the Base Case. As with Figures 1 and 2, the highlighted roadways include the Bayshore Freeway, US 101; the West Valley Freeway, SR 85; the Guadalupe Parkway, SR 87; and I-280.

Figure 3: 2035 Roadways at LOS F, with Traffic Increases Due to Narrowing



These serious traffic impacts were not disclosed or analyzed in the EIR. Furthermore, there were no analyses of other time periods where significant traffic congestion impacts are likely, particularly the weekday morning peak hour. The conclusion in the EIR (p.2-12) that "the reduction of travel lanes on Monterey Highway and the addition of HST would not be anticipated to result in a significant impact for the southbound segments" may be true but completely misses the point. The EIR modeling shows highly significant traffic impacts on other roadways that are not disclosed in the EIR

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smart mobility

Resume

NORMAN L. MARSHALL, PRINCIPAL

nmarshall@smartmobility.com

EDUCATION:

Master of Science in Engineering Sciences, Dartmouth College, Hanover, NH, 1982
Bachelor of Science in Mathematics, Worcester Polytechnic Institute, Worcester, MA, 1977

PROFESSIONAL EXPERIENCE:

Norm Marshall helped found Smart Mobility, Inc. in 2001. Prior to this, he was at Resource Systems Group, Inc. for 14 years where he developed a national practice in travel demand modeling. He specializes in analyzing the relationships between the built environment and travel behavior, and doing planning that coordinates multi-modal transportation with land use and community needs.

Regional Land Use/Transportation Scenario Planning

Chicago Metropolis Plan and Chicago Metropolis Freight Plan (6-county region)— developed alternative transportation scenarios, made enhancements in the regional travel demand model, and used the enhanced model to evaluate alternative scenarios including development of alternative regional transit concepts. Developed multi-class assignment model and used it to analyze freight alternatives including congestion pricing and other peak shifting strategies. Chicago Metropolis 2020 was awarded the Daniel Burnham Award for regional planning in 2004 by the American Planning Association, based in part on this work.

Envision Central Texas Vision (5-countyregion)—implemented many enhancements in regional model including multiple time periods, feedback from congestion to trip distribution and mode choice, new life style trip production rates, auto availability model sensitive to urban design variables, non-motorized trip model sensitive to urban design variables, and mode choice model sensitive to urban design variables and with higher values of time (more accurate for "choice" riders). Analyzed set land use/transportation scenarios including developing transit concepts to match the different land use scenarios.

Mid-Ohio Regional Planning Commission Regional Growth Strategy (7-county Columbus region)—developed alternative future land use scenarios and calculated performance measures for use in a large public regional visioning project.

Baltimore Vision 2030—working with the Baltimore Metropolitan Council and the Baltimore Regional Partnership, increased regional travel demand model's sensitivity to land use and transportation infrastructure. Enhanced model was used to test alternative land use and transportation scenarios including different levels of public transit.

Chittenden County (2060 Land use and Transportation Vision Burlington Vermont region) – leading extensive public visioning project as part of MPO's long-range transportation plan update.

Burlington (Vermont) Transportation Plan – Leading team developing Transportation Plan focused on supporting increased population and employment without increases in traffic by focusing investments and policies on transit, walking, biking and Transportation Demand Management.

Transit Planning

Regional Transportation Authority (Chicago) and Chicago Metropolis 2020 – evaluating alternative 2020 and 2030 system-wide transit scenarios including deterioration and enhance/expand under alternative land use and energy pricing assumptions in support of initiatives for increased public funding.

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Capital Metropolitan Transportation Authority (Austin, TX) Transit Vision – analyzed the regional effects of implementing the transit vision in concert with an aggressive transit-oriented development plan developed by Calthorpe Associates. Transit vision includes commuter rail and BRT.

Bus Rapid Transit for Northern Virginia HOT Lanes (Breakthrough Technologies, Inc and Environmental Defense.) – analyzed alternative Bus Rapid Transit (BRT) strategies for proposed privately-developing High Occupancy Toll lanes on I-95 and I-495 (Capital Beltway) including different service alternatives (point-to-point services, trunk lines intersecting connecting routes at in-line stations, and hybrid).

Central Ohio Transportation Authority (Columbus) – analyzed the regional effects of implementing a rail vision plan on transit-oriented development potential and possible regional benefits that would result.

Essex (VT) Commuter Rail Environmental Assessment (Vermont Agency of Transportation and Chittenden County Metropolitan Planning Organization)—estimated transit ridership for commuter rail and enhanced bus scenarios, as well as traffic volumes.

Georgia Intercity Rail Plan (Georgia DOT)—developed statewide travel demand model for the Georgia Department of Transportation including auto, air, bus and rail modes. Work included estimating travel demand and mode split models, and building the Departments ARC/INFO database for a model running with a GIS user interface.

Roadway Corridor Planning

Hudson River Crossing Study (Capital District Transportation Committee and NYSDOT) – Analyzing long term capacity needs for Hudson River bridges which a special focus on the I-90 Patroon Island Bridge where a microsimulation VISSIM model was developed and applied.

State Routes 5 & 92 Scoping Phase (NYSDOT) —evaluated TSM, TDM, transit and highway widening alternatives for the New York State Department of Transportation using local and national data, and a linkage between a regional network model and a detailed subarea CORSIM model.

Twin Cities Minnesota Area and Corridor Studies (MnnDOT)—improved regional demand model to better match observed traffic volumes, particularly in suburban growth areas. Applied enhanced model in a series of subarea and corridor studies.

Developing Regional Transportation Model

Pease Area Transportation and Air Quality Planning (New Hampshire DOT)—developed an integrated land use allocation, transportation, and air quality model for a three-county New Hampshire and Maine seacoast region that covers two New Hampshire MPOs, the Seacoast MPO and the Salem-Plaistow MPO.

Syracuse Intermodal Model (Syracuse Metropolitan Transportation Council)—developed custom trip generation, trip distribution, and mode split models for the Syracuse Metropolitan Transportation Council. All of the new models were developed on a person-trip basis, with the trip distribution model and mode split models based on one estimated logit model formulation.

Portland Area Comprehensive Travel Study (Portland Area Comprehensive Transportation Study)—Travel Demand Model Upgrade—enhanced the Portland Maine regional model (TRIPS software). Estimated person-based trip generation and distribution, and a mode split model including drive alone, shared ride, bus, and walk/bike modes.

Chittenden County ISTEA Planning (Chittenden County Metropolitan Planning Organization)—developed a land use allocation model and a set of performance measures for Chittenden County (Burlington) Vermont for use in transportation planning studies required by the Intermodal Surface Transportation Efficiency Act (ISTEA).

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Research

Obesity and the Built Environment (National Institutes of Health and Robert Wood Johnston Foundation) – Working with the Dartmouth Medical School to study the influence of local land use on middle school students in Vermont and New Hampshire, with a focus on physical activity and obesity.

The Future of Transportation Modeling (New Jersey DOT)—Member of Advisory Board on project for State of New Jersey researching trends and directions and making recommendations for future practice.

Trip Generation Characteristics of Multi-Use Development (Florida DOT)—estimated internal vehicle trips, internal pedestrian trips, and trip-making characteristics of residents at large multi-use developments in Fort Lauderdale, Florida.

Improved Transportation Models for the Future—assisted Sandia National Laboratories in developing a prototype model of the future linking ARC/INFO to the EMME/2 Albuquerque model and adding a land use allocation model and auto ownership model including alternative vehicle types.

Critiques

C-470 (Denver region) – Reviewed express toll lane proposal for Douglas County, Colorado and prepared reports on operations, safety, finances, and alternatives.

Intercounty Connector (Maryland) – Reviewed proposed toll road and modeled alternatives with different combinations of roadway capacity, transit capacity (both on and off Intercounty Connector) and pricing.

Foothills South Toll Road (Orange County, CA) – Reviewed modeling of proposed toll road.

I-93 Widening (New Hampshire) – Reviewed Environment Impact Statement and modeling, with a particular focus on induced travel and secondary impacts, and also a detailed look at transit potential in the corridor.

Stillwater Bridge – Participated in 4-person expert panel assembled by Minnesota DOT to review modeling of proposed replacement bridge in Stillwater, with special attention to land use, induced travel, pricing, and transit use.

Ohio River Bridges Projects– Reviewed Environmental Impact Statement for proposed new freeway bridge east of Louisville Kentucky for River Fields, a local land trust and historic preservation not-for-profit organization.

PUBLICATIONS AND PRESENTATIONS (partial list)

Understanding the Transportation Models and Asking the Right Questions. Lead presenter on national Webinar put on by the Surface Policy Planning Partnership (STTP) and the Center for Neighborhood Technologies (CNT) with partial funding by the Federal Transit Administration, 2007.

Sketch Transit Modeling Based on 2000 Census Data with Brian Grady. Presented at the Annual Meeting of the Transportation Research Board, Washington DC, January 2006, and *Transportation Research Record*, No. 1986, "Transit Management, Maintenance, Technology and Planning", p. 182-189, 2006.

Travel Demand Modeling for Regional Visioning and Scenario Analysis with Brian Grady. Presented at the Annual Meeting of the Transportation Research Board, Washington DC, January 2005, and *Transportation Research Record*, No. 1921, "Travel Demand 2005", p. 55-63, 2006.

Chicago Metropolis 2020: the Business Community Develops an Integrated Land Use/Transportation Plan with Brian Grady, Frank Beal and John Fregonese, presented at the Transportation Research Board's Conference on Planning Applications, Baton Rouge LA, April 2003.

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Comment Letter O012 - Continued

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Chicago Metropolis 2020: the Business Community Develops an Integrated Land Use/Transportation Plan with Lucinda Gibson, P.E., Frank Beal and John Fregonese, presented at the Institute of Transportation Engineers Technical Conference on Transportation's Role in Successful Communities, Fort Lauderdale FL, March 2003.

Evidence of Induced Travel with Bill Cowart, presented in association with the Ninth Session of the Commission on Sustainable Development, United Nations, New York City, April 2001.

Induced Demand at the Metropolitan Level – Regulatory Disputes in Conformity Determinations and Environmental Impact Statement Approvals, Transportation Research Forum, Annapolis MD, November 2000.

Evidence of Induced Demand in the Texas Transportation Institute's Urban Roadway Congestion Study Data Set, Transportation Research Board Annual Meeting, Washington DC: January 2000.

Subarea Modeling with a Regional Model and CORSIM" with K. Kaliski, presented at Seventh National Transportation Research Board Conference on the Application of Transportation Planning Methods, Boston MA, May 1999.

New Distribution and Mode Choice Models for Chicago with K. Ballard, Transportation Research Board Annual Meeting, Washington DC: January 1998.

"Land Use Allocation Modeling in Uni-Centric and Multi-Centric Regions" with S. Lawe, Transportation Research Board Annual Meeting, Washington DC: January 1996.

Multimodal Statewide Travel Demand Modeling Within a GIS with S. Lawe, Transportation Research Board Annual Meeting, Washington DC: January 1996.

Linking a GIS and a Statewide Transportation Planning Model, with L. Barbour and Judith LaFavor, Urban and Regional Information Systems Association (URISA) Annual Conference, San Antonio, TX, July 1995.

Land Use, Transportation, and Air Quality Models Linked With ARC/INFO, with C. Hanley, C. Blewitt, and M. Lewis, Urban and Regional Information Systems Association (URISA) Annual Conference,; San Antonio, TX, July 1995.

Forecasting Land Use Changes for Transportation Alternative with S. Lawe, Fifth National Conference on the Application of Transportation Planning Methods, Seattle WA, April 1995.

Forecasting Land Use Changes for Transportation Alternatives, with S. Lawe, Fifth National Conference on the Application of Transportation Planning Methods (Transportation Research Board),; Seattle WA, April 1995.

Integrated Transportation, Land Use, and Air Quality Modeling Environment with C. Hanley and M. Lewis Fifth National Conference on the Application of Transportation Planning Methods (Transportation Research Board), Seattle WA, April 1995.

MEMBERSHIPS/AFFILIATIONS

Member, Institute of Transportation Engineers
Individual Affiliate, Transportation Research Board
Member, American Planning Association
Member, Congress for the New Urbanism

O012 Exhibit I Included in O012-24

Caltrain 2025 Preliminary Hazard Analysis Worksheets
December 2009

The following are the detailed Preliminary Hazard Analysis (PHA) worksheets developed for the Caltrain 2025 Preliminary Hazard Analysis. The format for the worksheet is given followed by worksheets for the PHA scenarios:

A. EMU collision with auto driving around crossing gate
B. EMU collision with highway truck driving around crossing gate
C. EMU collision with pedestrian at grade crossing
D. EMU collision with auto at non-gated maintenance of way crossing
E. EMU collision with auto fouling tracks at gated grade crossing
F. EMU collision with highway truck fouling tracks at gated grade crossing
G. EMU in shared corridor strikes fright cargo that has dislodged
H. EMU collision with FRA-compliant locomotive
I. EMU collision with flat immovable object
J. EMU collision with object (derailed train)

For a summary of the PHA analysis process and a description of the results, see Caltrain's Waiver Request to FRA to Operate Mixed Traffic on the Caltrain Corridor, Chapter 4.

Format of PHA Worksheets
The PHA analysis is summarized into worksheets for each scenario. A sample worksheet can be found as Table 1.

The format of the PHA worksheets is as follows:

(1) PHA No: Hazard reference number

(2) Hazard Scenario – Description of the hazard circumstances

(3) Level – A scenario subset indicating speed at which the collision occurs

(4) No. – Hazard reference number subset number

(5) Hazard Description - Description of each postulated hazard

(6) Potential Cause – Description of those causal factors that create the hazardous condition

(7) Effect on the EMU - Description of the probable effect on the train passengers and crew and equipment in terms of severity

(8) Probability/Severity – The probability and severity of the hazardous condition for the development of the Initial HRI

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(9) Initial HRI – the Hazard Risk Index for the existing (2008) operating environment BEFORE the application of any mitigation measure

(10) Effect on the Motorist/Pedestrian - Description of the probable effect on the motor vehicle drive and passenger and vehicle or pedestrian in terms of severity in motorist/pedestrian scenarios

(11) Probability/Severity – The probability and severity of the hazardous condition relating to the Motorist/Pedestrian for the development of the Initial HRI

(12) Motorist/Pedestrian Initial HRI – the Hazard Risk Index for the existing (2008) operating environment BEFORE the application of any mitigation measure

(13) Controlling Measures – Practicable mitigation measures to be taken to reduce the severity and/or likelihood (probability) of the hazard condition

(14) Residual HRI – the Hazard Risk Index of the operating environment that is expected to result AFTER the application of the combined mitigation measures

(15) Resolution and Remarks Final HRI – The combination of the measures taken to reduce the severity/probability of the hazard condition AND the measures implemented through the Systemwide Grade Crossing Improvement Program

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Table 1 - Sample PHA Worksheet

PHA NO.: (1) Hazard Scenario: (2) Level: (3) REV NO.:	CALTRAIN 2025 PRELIMINARY HAZARD ANALYSIS								Performed By: Reviewed By: Approved By:	
	HAZARD CAUSE/EFFECT								MITIGATION OPTIONS	CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Controlling Measures	Residual HRI	Resolution and Remarks Residual HRI
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)

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PHA NO.: A.1
Hazard Scenario: Collision with Auto Driving Around Crossing Gate
Level: EMU Traveling Up To 70 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H. Saporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Residual HRI
A.1	Auto driving around or through crossing gate is struck by EMU traveling up to 70 MPH	2 quadrant gate system does not restrict motorist's action of driving around crossing gate	Minor injuries requiring medical treatment away for the scene of the accident Minor damage to exterior of vehicle Occupied volume not compromised	Occasional Marginal	15	Loss of Life Major Injuries Loss of Motor Vehicle	Occasional Critical	7	If space permits, install 60' median barrier If space permits, install 60' curb with channelization devices If configuration feasible, install 4 quadrant gates with presence detection Increase education and human enforcement Photo Enforcement	13 21	Expected residual HRI improvement is for the motorist and motor vehicle risk reduction that results from the reduced probability to Remote Expected residual HRI improvement is for the railroad carried people and equipment that results from the reduced probability to Remote

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PHA NO.: B.1
Hazard Scenario: Collision with Highway Truck Driving Around Crossing Gate
Level: EMU Traveling Up To 60 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H. Saporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Residual HRI
B.1	Highway truck drives around crossing gate and is struck by EMU traveling up to 60 MPH	2 quadrant gate system does not restrict driver's action of driving around crossing gate	Minor injuries and limited major injuries. Major damage to exterior of vehicle Occupied volume not compromised	Remote Serious	17	Loss of Life Major Injuries Loss of Motor Vehicle	Remote Critical	13	If space permits, install 60' median barrier If space permits, install 60' curb with channelization devices If configuration feasible, install 4 quadrant gates with presence detection Increase education and human enforcement Photo Enforcement	18 20	Expected residual HRI improvement is for the motorist and motor vehicle risk reduction that results from the reduced probability to Improbable Expected residual HRI improvement is for the railroad carried people and equipment that results from the reduced probability to Improbable

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O012 Exhibit I Included in O012-24

PHA NO.: C.1
Hazard Scenario: Collision with Pedestrian at Grade Crossing
Level: EMU Traveling Up To 79 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H. Saporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Ped	Probability Severity	Ped Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Final HRI
C.1	Pedestrian ignores grade crossing warning devices and steps/stands in path of EMU traveling up to 79 MPH	a) Pedestrian ignores warning devices b) Crossing gate or other mechanisms do not impede pedestrian travel c) Pedestrian stands within dynamic envelope of passing train	None	Occasional Negligible	20	Loss of life or major injuries	Occasional Critical	7	Pedestrian gates Swing gates Increased education and enforcement Fencing and/or plantings to channel pedestrians Tactile warning strips STOP HERE sidewalk markings	13 24	Expected residual HRI improvement is for the pedestrian risk reduction that results from the reduced probability to Remote Expected residual HRI improvement is for the railroad carried people and equipment that results from the reduced probability to Remote

O012 Exhibit I Included in O012-24

PHA NO.: D.1
Hazard Scenario: Collision with Auto at Non-Gated Maintenance of Way Crossing
Level: EMU Traveling Up To 70 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H. Saporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Residual HRI
D.1	Unauthorized motor vehicle enters ROW at Maintenance of Way crossing and is struck by train traveling up to 70 mph	a) Gate or other barrier not provided b) MOW crew fails to request permission to enter ROW	Minor injuries requiring medical treatment away for the scene of the accident Minor damage to exterior of vehicle. Occupied volume not compromised	Remote Marginal	21	Loss of life or major injuries Minor damage to exterior of vehicle. Occupied volume not compromised	Remote Critical	13	Install pipe gate with high security lock and fencing placed a minimum of 15 feet to each side of the gate Increase education and enforcement	16 22	Expected residual HRI improvement is for the motorist and motor vehicle risk reduction that results from the reduced probability to Improbable Expected residual HRI improvement is for the railroad carried people and equipment that results from the reduced probability to Improbable

Comment Letter O012 - Continued

O012
Exhibit I
Included in
O012-24

PHA NO.: E.1
Hazard Scenario: Collision with Auto Fouling Tracks at Gated Grade Crossings
Level: EMU Traveling Up To 70 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H. Saporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Residual HRI
E.1	EMU traveling up to 70 MPH strikes auto fouling tracks	a) Auto stops on tracks due to traffic back-up from adjacent intersection controlled by traffic signals	Minor injuries requiring medical treatment away for the scene of the accident Minor damage to exterior of vehicle Occupied volume not compromised	Probable Marginal	12	Loss of life Major injuries Loss of vehicle	Probable Critical	5	Presence sensing device interfaced with traffic controller to clear traffic when train approaches crossing Provide sufficient queuing for traffic between grade crossing and adjacent intersection Install DO NOT STOP ON TRACKS sign Pavement markings clearly indicating fouling area Increase No Stopping on Tracks education and enforcement Increase traffic light GO signal time for railroad crossing traffic	13 21	Expected residual HRI improvement is for the motorist and motor vehicle risk reduction that results from the reduced probability to Remote Expected residual HRI improvement is for the railroad carried people and equipment that results from the reduced probability to Remote

O012
Exhibit I
Included in
O012-24

PHA NO.: E.1
Hazard Scenario: Collision with Auto Fouling Tracks at Gated Grade Crossings
Level: EMU Traveling Up To 70 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H. Saporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Residual HRI
E.1	EMU traveling up to 70 MPH strikes auto fouling tracks	a) Auto stops on tracks due to traffic back-up from adjacent intersection controlled by stop sign	Minor injuries requiring medical treatment away for the scene of the accident Minor damage to exterior of vehicle Occupied volume not compromised	Probable Marginal	12	Loss of life Major injuries Loss of vehicle	Probable Critical	5	Provide sufficient queuing for traffic between grade crossing and adjacent intersection Install DO NOT STOP ON TRACKS sign Pavement markings clearly indicating fouling area Increase Do Not Stop on Tracks education and enforcement Evaluate crossing for potential sight obstructions Eliminate stop sign on railroad crossing road Coordinate traffic control device upgrades	13 21	Expected residual HRI improvement is for the motorist and motor vehicle risk reduction that results from the reduced probability to Remote Expected residual HRI improvement is for the railroad carried people and equipment that results from the reduced probability to Remote

Comment Letter O012 - Continued

O012 Exhibit 1 Included in O012-24

PHA NO.: E.1
Hazard Scenario: Collision with Auto Fouling Tracks at Gated Grade Crossings
Level: EMU Traveling Up To 70 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H. Saporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Residual HRI
E.1	EMU traveling up to 70 MPH strikes auto fouling tracks	c) Auto stops on tracks due to construction activity ahead	Minor injuries requiring medical treatment away for the scene of the accident Minor damage to exterior of vehicle Occupied volume not compromised	Probable Marginal	12	Loss of life Major injuries Loss of vehicle	Probable Critical	5	Coordinate construction activities with local jurisdiction and utilities so as to provide sufficient queuing between tracks and construction activity. Increase Do Not Stop on Tracks education and enforcement Employ alternative construction methods that do not impact or reduce queuing impacts Employ "Flag Persons" at the crossing to coordinate traffic flow and avoid queuing on the crossing	13 21	Expected residual HRI improvement is for the motorist and motor vehicle risk reduction that results from the reduced probability to Remote Expected residual HRI improvement is for the railroad carried people and equipment that results from the reduced probability to Remote

O012 Exhibit 1 Included in O012-24

PHA NO.: E.1
Hazard Scenario: Collision with Auto Fouling Tracks at Gated Grade Crossings
Level: EMU Traveling Up To 70 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H. Saporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Residual HRI
E.1	EMU traveling up to 70 MPH strikes auto fouling tracks	c) Auto fails to stop at stop bar and front end fouls tracks	Minor injuries requiring medical treatment away for the scene of the accident Minor damage to exterior of vehicle Occupied volume not compromised	Probable Marginal	12	Loss of life Major injuries Loss of vehicle	Probable Critical	5	Locate crossing gate sufficiently back to account for auto failing to stop at stop bar Install STOP HERE sign Increase education and enforcement Install DO NOT STOP ON TRACKS sign Install embedded red LED lights along stop bar edge (experimental in LA and Houston) Install reflective stop bar Illuminate crossing Improve motorist's sight of crossing approach	7 15	Expected residual HRI improvement is for the motorist and motor vehicle risk reduction that results from the reduced probability to Occasional Expected residual HRI improvement is for the railroad carried people and equipment that results from the reduced probability to Occasional

Comment Letter O012 - Continued

O012 Exhibit I Included in O012-24

PHA NO.: E.1 Hazard Scenario: Collision with Auto Fouling Tracks at Gated Grade Crossings Level: EMU Traveling Up To 70 MPH REV NO.: 2	CALTRAIN 2025 PRELIMINARY HAZARD ANALYSIS									Performed By: H. Saporta Reviewed By: M. Bailey Approved By: R. Doty
GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT						MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Residual HRI
E.1	EMU traveling up to 70 MPH strikes auto fouling tracks	e) Auto stalls or is stuck on tracks f) Abandoned auto on tracks	Minor injuries requiring medical treatment away for the scene of the accident Minor damage to exterior of vehicle Occupied volume not compromised	Remote Marginal	21	Loss of life Major injuries Loss of vehicle	Remote Critical	13			Practicable effective means of mitigation are not available to reduce the probability of collision with an auto stuck on track due to stall or abandoned

O012 Exhibit I Included in O012-24

PHA NO.: E.1 Hazard Scenario: Collision with Auto Fouling Tracks at Gated Grade Crossings Level: EMU Traveling Up To 70 MPH REV NO.: 2	CALTRAIN 2025 PRELIMINARY HAZARD ANALYSIS									Performed By: H. Saporta Reviewed By: M. Bailey Approved By: R. Doty
GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT						MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Residual HRI
E.1	EMU traveling up to 70 MPH strikes auto fouling tracks	g) While in the grade crossing, the motorist misjudges turn into parallel road way and enters ROW	Minor injuries requiring medical treatment away for the scene of the accident Minor damage to exterior of vehicle Occupied volume not compromised	Remote Marginal	21	Loss of life Major injuries Loss of vehicle	Remote Critical	13	Increase the level of roadway illumination at the crossing to better illuminate the railroad environment		Other additional practicable and more positive means of mitigation are not available to significantly reduce the probability of motorists turning from the crossing onto the track Increasing the illumination of the area is not considered sufficient to reduce the probability of the mishap to improbable

Comment Letter O012 - Continued

O012
Exhibit 1
Included in
O012-24

PHA NO.: F.1
Hazard Scenario: Collision with Highway Truck Fouling Tracks at Gated Grade Crossings
Level: EMU Traveling Up To 70 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H. Seporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Controlling Measures	Residual HRI	Resolution and Remarks Residual HRI
F.1	EMU traveling up to 70 MPH strikes truck fouling tracks	a) Truck stops on tracks due to traffic back-up from adjacent intersection controlled by traffic signals	Minor injuries and limited major injuries Major damage to exterior of vehicle. Occupied volume not compromised	Remote Serious	17	Loss of life Major injuries Loss of vehicle	Remote Critical	13	Presence sensing device interfaced with traffic controller to clear traffic when train approaches crossing Provide sufficient queuing for traffic between grade crossing and adjacent intersection Install DO NOT STOP ON TRACKS sign Pavement markings clearly indicating fouling area Education and enforcement of No Stopping On Tracks Provide increased GO signal for railroad crossing traffic	16 20	Expected residual HRI improvement is for the motorist and motor vehicle risk reduction that results from the reduced probability to improbable. Expected residual HRI improvement is for the railroad carried people and equipment that results from the reduced probability to improbable.

O012
Exhibit 1
Included in
O012-24

PHA NO.: F.1
Hazard Scenario: Collision with Highway Truck Fouling Tracks at Gated Grade Crossings
Level: EMU Traveling Up To 70 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H. Seporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Controlling Measures	Residual HRI	Resolution and Remarks Residual HRI
F.1	EMU traveling up to 70 MPH strikes truck fouling tracks	b) Truck stops on tracks due to traffic back-up from adjacent intersection controlled by stop sign	Minor injuries and limited major injuries Major damage to exterior of vehicle. Occupied volume not compromised	Remote Serious	17	Loss of life Major injuries Loss of vehicle	Remote Critical	13	Provide sufficient queuing for traffic between grade crossing and adjacent intersection Install DO NOT STOP ON TRACKS sign Pavement markings clearly indicating fouling area Increase Do Not Stop on Tracks education and enforcement Evaluate crossing for potential sight obstructions Coordinate traffic control device upgrades or eliminate stop sign for railroad crossing traffic	16 20	Expected residual HRI improvement is for the motorist and motor vehicle risk reduction that results from the reduced probability to improbable. Expected residual HRI improvement is for the railroad carried people and equipment that results from the reduced probability to improbable.

Comment Letter O012 - Continued

O012
Exhibit I
Included in
O012-24

PHA NO.: F.1
Hazard Scenario: Collision with Highway Truck Fouling Tracks at Gated Grade Crossings
Level: EMU Traveling Up To 70 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H. Seporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Controlling Measures	Residual HRI	Resolution and Remarks Residual HRI
F.1	EMU traveling up to 70 MPH strikes truck fouling tracks	c) Truck stops on tracks due to construction activity ahead	Minor injuries and limited major injuries Major damage to exterior of vehicle Occupied volume not compromised	Remote Serious	17	Loss of life Major injuries Loss of vehicle	Remote Critical	13	Coordinate construction activities with local jurisdiction and utilities so as to provide sufficient queuing between tracks and construction activity Increase LEA Not Stop on Tracks education and enforcement Employ construction methods that do not result in queuing or reduces queuing Employ "Flag Persons" at the crossing to regulate the flow of traffic and control queuing	16 20	Expected residual HRI improvement is for the motorist and motor vehicle risk reduction that results from the reduced probability to Improbable. Expected residual HRI improvement is for the railroad carried people and equipment that results from the reduced probability to Improbable.

O012
Exhibit I
Included in
O012-24

PHA NO.: F.1
Hazard Scenario: Collision with Highway Truck Fouling Tracks at Gated Grade Crossings
Level: EMU Traveling Up To 70 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H. Seporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Controlling Measures	Residual HRI	Resolution and Remarks Residual HRI
F.1	EMU traveling up to 70 MPH strikes truck fouling tracks	d) Truck fails to stop at stop bar and front end fouls tracks	Minor injuries and limited major injuries Major damage to exterior of vehicle Occupied volume not compromised	Remote Serious	17	Loss of life Major injuries Loss of vehicle	Remote Critical	13	Locate crossing gate sufficiently back to account for truck failing to stop at stop bar Install STOP HERE sign Increase education and human enforcement Install DO NOT STOP ON TRACKS sign Install embedded red LED lights along stop bar edge (experimental in LA and Houston) Install reflective stop bar Illuminate crossing	16 20	Expected residual HRI improvement is for the motorist and motor vehicle risk reduction that results from the reduced probability to Improbable. Expected residual HRI improvement is for the railroad carried people and equipment that results from the reduced probability to Improbable.

Comment Letter O012 - Continued

O012
Exhibit I
Included in
O012-24

PHA NO.: F.1
Hazard Scenario: Collision with Highway Truck Fouling Tracks at Gated Grade Crossings
Level: EMU Traveling Up To 70 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

~~Performed By: H Saporta~~
Reviewed By: M Bailey
Approved By: R Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Controlling Measures	Residual HRI	Resolution and Remarks Residual HRI
F.1	EMU traveling up to 70 MPH strikes truck fouling tracks	e) Truck stalls or is stuck on tracks f) Abandoned truck on tracks	Minor injuries and limited major injuries. Major damage to exterior of vehicle. Occupied volume not compromised.	Remote Serious	17	Loss of life Major injuries Loss of vehicle	Remote Critical	13			Practicable effective means of mitigation are not available to reduce the probability of a collision with a truck stuck on track due to stall or left abandoned there

O012
Exhibit I
Included in
O012-24

PHA NO.: F.1
Hazard Scenario: Collision with Highway Truck Fouling Tracks at Gated Grade Crossings
Level: EMU Traveling Up To 70 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H. Saporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT							MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on Motor Vehicle	Probability Severity	Motor Vehicle Initial HRI	Controlling Measures	Residual HRI	Resolution and Remarks Residual HRI
F.1	EMU traveling up to 70 MPH strikes truck fouling tracks	g) While in grade crossing, truck driver misjudges turn into parallel road way and enters ROW	Minor injuries and limited major injuries. Major damage to exterior of vehicle. Occupied volume not compromised	Remote Serious	17	Loss of life Major injuries Loss of vehicle	Remote Critical	13	Increase the level of illumination at and adjacent to the crossing to better show the railroad environment		Other additional practicable effective means of mitigation are not available to significantly reduce the probability of motorists turning from the crossing onto the track The identified mitigation is not considered to be sufficient to reduce the probability of this type of mishap to improbable

Comment Letter O012 - Continued

O012 Exhibit 1 Included in O012-24

PHA NO.: G.1
Hazard Scenario: EMU in Shared Corridor Strikes Freight Cargo
Level: EMU Traveling Up To 70 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: H Saporta
Reviewed By: M. Bailey
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT				MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Resdual HRI
G.1	EMU in shared corridor strikes freight cargo that has dislodged	a) Freight shifts while in transport and encroaches the dynamic envelope of EMU on adjacent track b) Freight shifts while in transport and falls into path of EMU on adjacent track	Minor injuries requiring medical treatment away for the scene of the accident Minor damage to exterior of vehicle. Occupied volume not compromised	Remote Marginal	21	Install presence sensing devices at strategic locations on the ROW. Upon detection of improperly extended lading, an alert is sent to the EMU operating engineer and the dispatcher. Implementation of temporal separation of freight and passenger (EMU) traffic and dispatch control functions to manage commingling.	22	Application of irregular load sensing equipment and temporal separation functions reduce the expected probability of such conditions within the operating environment to Improbable

O012 Exhibit 1 Included in O012-24

PHA NO.: H.1.1
Hazard Scenario: Collision between EMU and FRA Compliant Locomotive
Level: EMU Traveling 20 MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: M Bailey
Reviewed By: D. DiBrito
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT						MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Effect on FRA Compliant	Probability Severity	FRA Compliant Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Residual HRI
H.1.1	Engineer fails to slow the train adequately and stop short of another train to avoid impact while under manual control subject to Restricted Speed	Train engineer inattention	Minor injuries and limited major injuries Major Damage to Exterior of EMU, Occupied volume is not compromised	Improbable Serious	20	Minor injuries and limited major injuries Major Damage to Exterior of EMU, Occupied volume is not compromised	Improbable Serious	20	Reduce Restricted Speed to 15 MPH the level at which severity transitions to "Marginal CBOSS limits the train speed to 20 MPH when in the Restricted Manual Mode	22	A design solution that completely avoids the risk of collision caused by inattention of the Engineer is not possible. RESTRICTED SPEED enforcement by CBOSS is expected to marginally reduce this risk by capping travel speed to 20 MPH in manual mode. The reduction of permitted manual operating speed to 15 MPH might be expected to result in lower impact speeds resulting in reduced severity and probability of collision. The assumption that 20 mph is a typical impact speed for such conditions is not supported by available data. It is reasonable to assume that a lower impact speed is more typical. The very small and uncertain safety improvement from a lowering of RESTRICTED SPEED from 20 MPH to 15 MPH is not justifiable. RESTRICTED SPEED will remains at 20 MPH

Comment Letter O012 - Continued

O012 Exhibit 1 Included in O012-24

PHA NO.: I.1
Hazard Scenario: EMU Collides with Fiat Immovable Structure
Level: EMU derails and impacts with fixed object at 10MPH
REV NO.: 2

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: M. Bailey
Reviewed By: D. DiBrito
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT				MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Residual HRI
I 1 1	EMU collides with wayside immoveable structure	Post derailment after: a) Collision with another EMU or FRA-compliant Vehicle b) Track in poor repair c) EMU in poor repair d) Rail vehicle overspeed	Minor injuries and limited major injuries Major Damage to Exterior of EMU, Occupied volume is not compromised	Improbable Serious	20	Implement more rigorous track preventive maintenance program Implement more rigorous EMU preventive maintenance program Maintain infrastructure design criteria requiring adjacent fixed object structures be kept to a minimum and placed back away from the operating envelope to the degree possible and particularly away from special trackwork areas Continue to apply Caltrain design criteria that requires a check rail to be used when in areas that exhibit this risk	20	A design solution that completely avoids the risk of derailment due to improper operation or vehicle equipment or track failures is not possible. Continue use of existing controlling measures.

O012 Exhibit 1 Included in O012-24

PHA NO.: J.1.1
Hazard Scenario: EMU Collision with Object (Derailed Train)
Level: Train derails and EMU impacts with side of train at or above 25 MPH
REV NO.: 1

CALTRAIN 2025
PRELIMINARY HAZARD ANALYSIS

Performed By: M. Bailey
Reviewed By: D. DiBrito
Approved By: R. Doty

GENERAL DESCRIPTION		HAZARD CAUSE/EFFECT				MITIGATION OPTIONS		CORRECTIVE ACTION
No.	Hazard Description	Potential Cause	Effect on EMU	Probability Severity	EMU Initial HRI	Mitigation Measures	Residual HRI	Resolution and Remarks Residual HRI
J 1 1	EMU collision with object (derailed train) across the path	a) Track in poor repair b) EMU in poor repair c) Earthquake d) Bridge displacement (due to strike earthquake) e) Adjacent Railroad Derailment f) Rail vehicle overspeed	Major Damage to Exterior of EMU, Occupied volume is compromised	Improbable Catastrophic	14	Implement more rigorous track preventive maintenance program Implement more rigorous EMU preventive maintenance program Integrate seismic event detection into CBOSS to allow direct and immediate speed reduction when the condition is indicated Implement sensors to detect a derailment and require CBOSS to automatically reduce speed (and stop) of approaching trains Implement sensors to enable CBOSS to respond to degraded track conditions inconsistent with the allowable speed Implement intrusion/derailment detection equipment to interface with CBOSS for automatic intervention. Implement derailment containment structures Temporal separation of freight train operations.	14	Collision with a derailed train is a possibility and can be expected to result in casualties, particularly involving persons unable to quickly move to an area of safety from the derailed train cars. Accident consequences are expected to be equivalent for EMU and compliant trains in these scenarios, both being Catastrophic. Reducing the severity of the mishap consequences to Critical is not practicable for either type of vehicle While the severity of the outcome cannot be practically reduced, Probability can be reduced but not eliminated. The benefits of introducing additional mitigation is limited since the mishap probability is already classified as improbable. CBOSS based mitigation might reduce some risks, but would introduce other risks due to false activation Controlling measures involving infrastructure changes are disproportionately costly for benefit Temporal separation segregates and reduces freight operations on adjacent tracks during passenger operating hours and lowers derailment risk though as the risk is already low the improvement is marginal.

Comment Letter O012 - Continued

OLBERDING ENVIRONMENTAL, INC.
Wetland Regulation and Permitting

O012
Exhibit J
Included in
O012-26

April 23, 2010

Mr. David Schonbrunn
Transportation Solutions Defense
& Education Fund
P.O. Box 151439
San Rafael, California 94915

SUBJECT: Environmental Assessment Methodology Review Concerning the Bay Area to Central Valley High Speed Rail Project Alternatives

Dear Mr. Schonbrunn:

At the request of Transportation Solutions Defense and Education Fund, Olberding Environmental has completed a review of Chapter 15 of the Bay Area to Central Valley High Speed Rail Project Final Environmental Impact Report (FEIR). It has been requested that Olberding Environmental review the biological resources and wetlands section associated with the FEIR to see how the impacts to the Grasslands Ecological Area (GEA) near Los Banos and the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge) in Alviso were evaluated at a programmatic level. The following report lists the values and functions of sensitive habitats associated with wetlands, compares the two areas in question, and states the means with which a biological evaluation should be conducted.

WETLAND FUNCTIONS AND VALUES

Wetland systems serve many functions and provide many benefits. Their potential for supporting large plant and animal populations of diverse species is high. Wetlands act as nutrient sinks and thus usually have dense and varied vegetation which provides the base for many aquatic and terrestrial food chains. Wetlands can also improve water quality. This is done through the filtering capacity of dense stands of wetland vegetation, which provide an efficient means of removing suspended solids from polluted waters.

Wetlands provide important resting, breeding, feeding, and rearing habitat for many species of waterfowl, mammals, amphibians, invertebrates, and fish, many of which are special-status species. These areas also contribute to the biodiversity of an area by providing migratory corridors. Primary environmental corridors are areas consisting of a concentration of a variety of natural resource features, such as wetlands, floodplains and woodlands.

Wetlands also serve as effective flood control and erosion buffers. Areas of shallow water and associated vegetation can slow the velocity and desynchronize the peaks of flood water and thus reduce shoreline and river bank erosion. They can also act as groundwater discharge and recharge areas. Recreational values associated with wetlands include observing birds and other wildlife, fishing, hunting, and canoeing. Wetlands are also important for their aesthetic value.

3170 Crow Canyon Place, Suite 260 · San Ramon, CA 94583 · Office: (925) 866-2111 · Fax: (925) 866-2126
Email: Jeff@olberdingenv.com

O012
Exhibit J
Included in
O012-26

DON EDWARDS SAN FRANCISCO BAY NATIONAL WILDLIFE REFUGE

As of 2004, the Refuge spans 30,000 acres of open bay, salt pond, salt marsh, mudflat, upland and vernal pool habitats located throughout South San Francisco Bay. Located along the Pacific Flyway, the Refuge hosts over 280 species of birds each year. Millions of shorebirds and waterfowl visit the Refuge during the spring and fall migration. In addition to its seasonal visitors, the Refuge provides critical habitat to resident species like the endangered California clapper rail, salt marsh harvest mouse, and vernal pool tadpole shrimp as well as the threatened California tiger salamander.

The Don Edwards San Francisco Bay National Wildlife Refuge is part of a complex made up of six other wildlife refuges in the San Francisco Bay Area. Founded in 1974 and administered by the U.S. Fish and Wildlife Service (USFWS), it was renamed Don Edwards San Francisco Bay National Wildlife Refuge in 1995 in recognition of Congressman Don Edwards' efforts to protect sensitive wetlands in South San Francisco Bay.

GRASSLANDS ECOLOGICAL AREA

According to the USFWS website, *"The GEA is the largest remaining contiguous block of freshwater wetlands remaining in California. It consists of federal, state, and privately owned seasonal, semi-permanent, and permanent marshes, riparian corridors, vernal pool complexes, and grasslands."*

This wild approximately 180,000 acre parcel of land is mostly privately owned; in fact 110,000 acres are not managed by the government. This very unique area reportedly comprises the "last 5 percent of such areas" left in California. Not only does the GEA provide critical wintering habitat for hundreds of thousands of migrating waterfowl and shorebirds of the Pacific Flyway per year, but it also provides habitat for more than 550 species of plants and animals, including 47 species that are endangered, threatened, or candidate species. Special-status species known to occur in this habitat include the San Joaquin kit fox, Aleutian Canada (cackling) goose, sand hill crane, Swainson's hawk, and tri-colored blackbird.

PRIMARY PROJECT IMPACTS

Primary impacts are usually associated with construction. Since many wetlands are islands of a unique habitat surrounded by upland communities, the loss of this habitat reduces its ability to support wildlife associated with wetlands. Wetland species, therefore, have unique requirements and adaptations that can only be met by the special characteristics of wetlands. Construction can lead to barriers to the movement of amphibians and reptiles to near-shore breeding areas, and the movement of mammals among feeding, breeding, and resting areas. Construction noise has a potential for interrupting courtship, breeding, nesting, and prey/predator location behavior for species that depend upon audio cues for these activities.

Comment Letter O012 - Continued

O012
Exhibit J
Included in
O012-26

SECONDARY PROJECT IMPACTS

These impacts are generally associated with the operation and maintenance of the facility or are those that occur over time as a result of initial construction. Railroad noise could eliminate use of wetland habitat adjacent to the railroad for breeding purposes by some species. Road kills will occur, particularly during dispersal periods when wildlife are actively moving in response to seasonal water level changes or other breeding and feeding requirements.

EVALUATION OF BIOLOGICAL VALUE

The significance of impacts should be viewed in terms of the functions of a particular wetland and how these might be affected. Just because a certain area may contain far more species diversity than another does not necessarily make it more valuable from a function standpoint. Many factors need to be considered, namely the types and amount of aquatic wildlife, waterfowl, the extent of habitat lost, and most importantly, the types and biodiversity of special-status species, namely those that are threatened or endangered. Other factors included in this evaluation involve discussions of flood storage and water quality functions, such as sediment and nutrient trapping, as well as wildlife habitat, food chain support, and those other values mentioned above. Fringe encroachments on wetlands tend to be less significant. However, the fringe of a wetland can provide critical resources, such as food, shelter, or nesting. Size and location of wetlands are also important considerations. Most of these factors appear to have been ignored in evaluating the relative impacts of the various alignments.

In most cases, impact significance can be estimated based on a thorough knowledge of the local ecology or land use of the project area. Coordination with the USFWS and local government agencies is a way to gain information about the uses and importance of the wetland. Once this has been done, an evaluation can be made stating whether the changes proposed will be significant. This type of analysis should be made for all alternatives with differences in each being highlighted. For example, all project alternatives might involve wetland loss, but the site for one alternative might be located away from a wildlife nesting area or food source.

In our review of Chapter 15 of the FEIR it is evident that a thorough and extensive review of back ground data has occurred. Numerous reference materials have been cited suggesting that multiple factors have been considered in the evaluation of habitat and biological values associated with each alternative alignment. However, there is no mention of any type of habitat assessment methodology that has been adopted to standardize the evaluation process. While there are many variations of habitat assessment methodology being implemented today, there is no discussion of a standardized approach used in the FEIR to evaluate habitats within the proposed alternative alignments. Both the USFWS and California Department of Fish and Game utilize specific habitat assessment methodologies when evaluating biological resources. These agencies should be consulted in order to provide a standardized approach to the assessment of biological values associated with the proposed alternatives. Species numbers and an assessment of acreage impacts to specific habitat types alone would not be adequate in providing an evaluation of true biological value. As a result, the analysis of biological resources and wetlands is inadequate, even at the programmatic level. There is not enough information to make a scientifically sound determination of the biological and ecological values and the potential

3

O012
Exhibit J
Included in
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impacts that the project would have on those values. The FEIR did not determine the significance of the impacts on those values. Thus, it is impossible to determine whether the impacts can be mitigated.

As discussed above, many factors would need to be considered in order to implement an evaluation process to adequately assess the value of biological resources. With so much emphasis being placed on providing an extensive list of reference materials which have apparently been used in the evaluation process it is disheartening to see a simplified summary section, whose conclusions as to biological values are not supported by the evidence presented. I strongly believe that a standardized habitat assessment approach is essential in the evaluation of biological value for each of the alternative alignments and that this information should have been made available for review.

All of the proposed alternative alignments will incur biological impacts to some degree. An attempt should be made to properly evaluate the sensitivity of habitats being impacted on a local and regional basis using a standardized process. This information should be used in the selection of alternative alignments which first avoids those areas deemed most biologically sensitive then focusing on alignments which reduces impacts to biological resources. Once this process is completed, mitigation measures could be designed into the project to further compensate impacts. Both the Refuge and GEA are considered to be highly sensitive biological areas.Any potential transportation use that could affect them must have a careful and comprehensive scientific analysis. The analysis in the Programmatic FEIR did not meet that standard.

If you have any questions, please feel free to contact me at (916) 985-1188.

Sincerely,

Jeff Olberding
Wetland Regulatory Scientist

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Response to Letter O012 (Stuart M. Flashman, Law Offices of Stuart M. Flashman, April 26, 2010)

O012-1

The comment questions the title of the Revised Draft Program EIR Material. The Authority has followed the provisions in CEQA Guidelines section 15088.5 regarding recirculation of an EIR. Section 15088.5(f)(2) identifies the ability of a lead agency to recirculate only those portions of the EIR that involve revisions.

O012-2

The comment suggests that the Authority is legally required to provide a substantive response to any comments received during the comment period that related to the proposed project. The Authority disagrees with this statement. CEQA Guidelines section 15088.5 provide a mechanism whereby a lead agency revising and recirculating a portion of a prior EIR can ask the public to focus its comments on the new material. The lead agency is required to respond only to those comments that pertain to the new material. Nevertheless, in this document, the Authority is providing a good faith, reasoned response, to all of the significant environmental issues raised in the comments received.

O012-3

The comment provides citation and discussion of *Laurel Heights Improvement Assn. v. Regents of University of California* (*Laurel Heights II*) to support the position that the Authority is required to respond to all comments received during the comment period, even if the comments do not pertain to the recirculated material. The Authority disagrees with this interpretation of the *Laurel Heights II* case. Nevertheless, in this document, the Authority is providing a good faith, reasoned response, to all comments received.

O012-4

The comment states that the Court in the Town of Atherton case suggested that UPRR's refusal to allow use of its right-of-way has rendered both the primary Altamont and primary Pacheco alignment alternatives studied in the prior EIR to be infeasible, and that the entire prior program EIR/EIS should have been reopened as to alternatives. The Authority disagrees. The Court did not hold any of the network alternatives were infeasible. Rather, the Court held the Final Program EIR "studied a reasonable range of alternatives and presented a fair and unbiased analysis." (Court Ruling, page. 17.) As required by the Town of Atherton ruling, the Revised Draft Program EIR identifies impacts that may result if UPRR remains unwilling to allow use of its rights-of-way for HST track. The document does not conclude that either the Altamont or the Pacheco network alternatives are infeasible. Consistent with the court ruling, the Revised Draft Program EIR discloses changes to the impacts analysis for the alternatives previously studied rather than new alternatives. See Chapter 3 in Volume 1 of the Revised Final Program EIR.

O012-5

The Authority disagrees that there is new information on the ridership model, disagrees that the model is defective, and disagrees that the prior EIR is defective due to the model. See also Standard Response 4.

O012-6

The comment has not accurately characterized the Town of Atherton ruling, which includes the following: "The Court finds that the EIR provides an adequate description of HSR operations, supported by substantial evidence. The ridership forecasts were developed by experts in the field of transportation modeling and were subject to three independent peer review panels." (Ruling, pp. 7-8.) The Authority also disagrees with the characterization that new information exists that was not available previously. The ridership and revenue forecasting model was developed for a public agency, the Metropolitan Transportation Commission, and it has been available to the public since 2007, including all components of the

model.[1] The model has provided a robust tool for forecasting ridership and identifying certain of the environmental impacts in the Program EIR.

O012-7

The ridership forecasts used in the Bay Area to Central Valley Program EIR contributed to the analysis of certain environmental impacts. See the May 2008 Final Program EIR, pp. 2-11 and 2-12. We agree that ridership and revenue modeling is important for the HST system planning process as well as for future financing purposes. See also Standard Response 4.

O012-8

The 2008 Final Program EIR explains that Cambridge Systematics developed ridership and revenue forecasts based on a newly developed travel demand model created for MTC to support continued development and environmental review of the HST system. Many of the reports that Cambridge Systematics prepared as part of the modeling effort between 2005 and 2007 were cited in the EIR and made available on the Authority's website. These reports, all of which clearly identified MTC as the agency contracting for the ridership and revenue forecasting work, were included in the litigation record for the Town of Atherton case. The California High-Speed Rail Authority staff did not obtain the model from MTC in 2007. Authority staff understand, however, that the model has been publicly available from MTC since the fall of 2007, when the model was delivered to MTC by Cambridge Systematics. The computer model itself was not included in the litigation record for the Town of Atherton case. We acknowledge receipt of Exhibit A to this letter, the report by Norman Marshall of Smart Mobility, Inc. We disagree that the changes to the model coefficients that occurred in the normal course of model calibration and validation constitute significant new information that triggers further revision and recirculation of the program EIR. See Standard Response 4.

[1] Memorandum from Mehdi Morshed, California High-Speed Rail Authority, to Chairman Pringle (March 3, 2010)

O012-9

The judgment in the Town of Atherton case did not find fault with the range of alternatives studied in the Program EIR, or require additional study of alternatives dismissed from further consideration. It required additional clarification regarding certain sections of the Program EIR, which was provided in the 2010 Revised Draft Program EIR. The comment incorrectly states that the EIR now includes only one alternative for Altamont and one alternative for Pacheco. This is not the case. Chapter 3 describes the relationship of all alignments previously studied in the 2008 Final Program EIR to UPRR rights of way and indicates the change in land use and property impacts if UPRR-owned right of way is unavailable for any portion of the HST system. These prior alignments were capable of being combined into a total of 21 representative network alternatives, and within these representative network alternatives alignment variations were also evaluated. Each these network alternatives and alignment variations remains before the Authority board for its consideration. The Final Program EIR in concert with the 2010 Revised Draft Program EIR Material provide thorough descriptions and evaluations at the program level, consistent with CEQA, of a reasonable range of alternatives that enables the Authority Board to make a determination regarding a preferred alternative and certify a new EIR.

The other alternatives mentioned in this comment and Exhibit B attached to the comment letter were developed in response to public comment provided on the Notice of Preparation for the project-level EIR/EIS for the San Jose to Merced Section of the HST system. The NOP for that section identified and included a map of the preferred alternative from the 2008 Final Program EIR. Scoping comments were provided from the public and agencies that proposed alignments that were variations on the 2008 preferred alternative but within that corridor. The proposed variations were then evaluated in an Preliminary Alternatives Analysis, which is intended to assure that a reasonable range of alternatives are evaluated in the project-level EIR/EIS. These more detailed and geographically refined alternatives are appropriately examined in the project-level environmental documents. The very preliminary consideration of more detailed, project-level alternatives for potential

inclusion in a draft project-level EIR/EIS are appropriately limited to the project-level documents and CEQA does not require that they be incorporated into the program EIR.

O012-10

See Response to Comment O012-9.

O012-11

The Authority acknowledges receipt of Exhibit C to this comment letter, an April 25, 2010, report by Setec Ferroviaire entitled "Evaluation of an Alignment for the California High-Speed Rail Project Bay Area to Central Valley Segment." Although the Superior Court in the Town of Atherton case did not require the Authority to study further alternatives, the Authority has evaluated the proposed Altamont Pass alternative in this report. This response summarizes the Authority's observations on what we will call the "Setec Alternative." The Setec Alternative described in Exhibit C involves: (1) Altamont Pass to Fremont; (2) routes through Fremont; (3) a San Jose connection from Fremont; (4) a crossing of the Bay at Dumbarton and line to a junction at Redwood City; and (5) and possible use of Highway 101 from Redwood City to South San Francisco.

ALTAMONT PASS TO FREMONT

The portion of the Setec Alternative from the Altamont Pass to Fremont is similar to an option considered and rejected from detailed study in the 2008 Final Program EIR due to higher environmental impacts and less ability to meet project objectives than other alternatives in this area. The 2008 Final Program EIR did evaluate an alternative near State Route 84. It was rejected for the following reasons as stated in Chapter 2:

> ***"SR-84/South of Livermore Alignment Alternative:*** *This alignment alternative would extend east near the UPRR alignment alternative through Niles Canyon then follow the SR-84 corridor south of Pleasanton and Livermore and continue east (south of Livermore) to the Patterson Pass corridor and to Tracy. Station location options include the Pleasanton (I-680/SR-84) station or Livermore (South Isabel)."*
>
> *"The SR-84/South of Livermore alignment alternative was eliminated from further investigation because it would have high potential impacts to the natural environment and to agricultural lands. This alignment alternative would cut through agricultural areas and undeveloped conservation easements, increasing habitat fragmentation. The SR-84/South of Livermore alignment alternative would have greater potential impacts to high value aquatic resources and threatened and endangered species than other alignment alternatives through the Tri-Valley (Livermore, Pleasanton, and Dublin) area."*
>
> *"In the mid 1980s, citizens approached Alameda County about a plan allowing for agriculture to be preserved and reinvigorated. The county responded with a plan that requires land to be put under easement for agricultural use to offset housing developments in the southern half of the valley. The South Livermore Valley Area Plan that was adopted several years later requires developers to find or plant an acre of cultivatable agriculture for every lot that was built up and for every acre covered with housing. The easements were put into the hands of the South Livermore Valley Area Trust, now the Tri-Valley Conservancy, which holds them in perpetuity. There are 3,059 agricultural acres in 30 properties under easement, mostly vineyards, olive groves, and grazing. There is one non-agricultural easement of 371 acres of parkland. Figure 2-D-5 shows the location of the SR-84/South of Livermore alignment alternative and its relation to the easements as they existed in 2002."*
>
> *"There are several state and federal Endangered Species Act concerns associated with the SR-84/South of Livermore alignment alternative. Due to the more undeveloped setting of this alignment alternative, there is a higher likelihood of adverse effects to protected species including creation of a barrier to migration for California tiger salamanders and California red-legged frog. This area is the northern range*

of the San Joaquin kit fox; and therefore this alignment alternative may also create a barrier to movement by the San Joaquin kit fox. Barriers to movement fragment remaining habitat for these species, leading to greater population isolation and possible species loss. There is also a greater potential for effects to Alameda whipsnakes in the Sunol Valley area and listed branchiopods (fairy shrimp) along this alignment alternative. The Sunol Valley is the only likely connection between two large populations of the Alameda whipsnakes that could be adversely affected by the high speed rail line, which would create another barrier/hazard. In addition, the construction of this alignment alternative through the undeveloped and rural open-space and agricultural areas would introduce a higher likelihood for adverse affects on aquatic resources, particularly when compared to the other alignment alternatives for the Tri-Valley area that are within existing rail or freeway rights-of-way."

"The SR-84/South of Livermore alignment alternative would by-pass the existing urbanized areas of Livermore, Pleasanton, and Dublin and is remote with respect to the existing BART and Altamont Commuter Express routes. As such, it would not be feasible to provide regional or longer-distance services which would provide convenient access to downtown Livermore or Pleasanton. Candidate station location options along this segment would not support transit-oriented development as well as downtown stations. Development of a transfer point with BART on the SR-84/South of Livermore alignment alternative would not be feasible without a significant extension of the BART line."

Given the location for the Setec Alternative in the same general corridor as the SR-84/South of Livermore Alignment Alternative and its proximity to the same resources, it would appear that the Setec Alternative would have the same high potential impacts to the natural environment and to agricultural lands.

ROUTES THROUGH FREMONT – NILES CANYON TO DUMBARTON

In the 2008 Final Program EIR, two corridors were considered across Newark and Fremont from the Dumbarton crossing to Niles Canyon: (1) Fremont route along the power line, and (2) Fremont route via Centerville line. These constituted a reasonable range of alternatives for this portion of the study area. Both of these alternatives are generally the same as those discussed in the Setec Alternative.

1. Fremont route along power lines: This option was discussed in the Bay Area - Central Valley EIR/EIS, called the "Dumbarton - Fremont Central Park" alignment alternative. It is generally the same horizontal alignment, with slight variations suggested for the vertical alignment.

   Of note, Exhibit C on page 8/46 notes, "Between point Nº1 and Nº2: the route would go along power lines and through abandoned salt ponds." Those ponds in Newark are still in production.

   Exhibit C on page 12/46 notes, "In conclusion, the HSR route along the power line seems to have greater problems than the two next alternatives discussed."

2. Fremont route via Centerville Line: This option was discussed in the 2008 Final Program EIR/EIS, called the "Dumbarton - Centerville" alignment alternative. The SETEC report considers this alignment alternative only feasible if the UPRR will allow its conversion to exclusively passenger use. This most probably requires the UPRR to sell the line and relinquish any freight operations along the line. It would leave no freight connection across Fremont from Niles Canyon to the Coast Line for the UPRR. The HST would still need to construct separate facilities in the corridor, as the Altamont Commuter Express, ACE, and Capitol Corridor trains are FRA-compliant trains, not compatible with HST operations. The SETEC report mentions the possibility of an interchange station with BART where the lines cross near Shinn Street in northern Fremont. While advantageous to offer this connection, the location is bounded on three sides by

residential neighborhoods and lacks good highway access. To minimize impacts on the adjacent residential uses, the stations would need to meet in an "L" configuration, with BART platforms extending from the crossing to the north and the HST and commuter platforms extending from the crossing to the east. This would entail a long connection between BART and other rail platforms. The remainder of the site is constrained by the UPRR line and Alameda Creek. This limits feasible connections to adjacent arterials and highways.

The Exhibit C alignment assumes a joint-use of the San Francisco PUC's South Bay Division right-of-way. The Authority sent a letter from Dan Leavitt to the San Francisco PUC requesting a review of this alignment in relation to its right-of-way and facilities. The letter is provided below. Exhibit C was attached to the letter. The SFPUC response to the Authority's letter is provided below following Mr. Leavitt's letter.

On page 2 of Mr. Harrington's letter, he states:

> *"In general, the proposal is not feasible. As shown, the proposal would not allow the vital functioning of the BDPLs, especially after an earthquake. In order to make the proposal workable, the costs and impact to schedule for the HSR would be significant."*

Mr. Harrington provides the underlying reasons for this statement in the remainder of the letter.

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

July 26, 2010

Ed Harrington, General Manager
San Francisco Public Utilities Commission
1155 Market Street, 11th Floor
San Francisco, CA 94103

Dear Mr. Harrington,

As the Deputy Director of the California High Speed Rail Authority, I am writing to request you or your staff to review a proposal that has been submitted to the Authority for a high speed rail route across Newark and Fremont. The proposal suggests joint use of the Bay Division Pipeline right-of-way.

The proposal was provided to us from the California Rail Foundation, Transportation Solutions Defense, and Education Fund, and Planning and Conservation (Stuart Flashman) as part of a comment letter on the *Bay Area to Central Valley High-Speed Train Revised Draft Program Environmental Impact Report Material*, California High-Speed Rail Authority, March 2010. The comment letter makes reference to a study prepared by Setec Ferroviare entitled "Evaluation of an Alignment for the California High-Speed Rail Project Bay Area to Central Valley Segment," dated April 25, 2010. The exhibit, identified as Exhibit C included in L00120-11," is appended to this letter. Under the Setec proposal, the high speed railway would be placed below grade in a cut-and-cover tunnel for a portion of the Bay Division Pipeline. Attachment 1 shows the proposed alignment. Two alternate configurations are proposed (Attachment 2).

Since you own, maintain, and construct facilities in this right-of-way, I would greatly appreciate it if you would respond to this proposal in writing, including comments on feasibility (including construction phasing), possible impacts to your planned or under construction facilities (including impacts during or after construction), regulations and procedures to work in the vicinity of your facilities, and any other pertinent comments. We would like to use your written response as part of our response to comments for our Bay Area to Central Valley Revised Draft Program EIR Material. The responses to comments are currently in final stages of preparation, so we hope that you can provide your response by August 6, 2010. As we need a quick response, we expect no more than a few concise paragraphs.

925 L Street, Suite 1425 · Sacramento, CA 95814 · 916.324.1541 · fax 916.322.0827
www.cahighspeedrail.ca.gov

Letter from Dan Leavitt of the CAHSRA to San Francisco Public Utilities Commission

Mr. Ed Harrington
July 21, 2010
Page 2

If you have any questions regarding this request, please direct them to Gary Kennerley at Parsons Brinkerhoff at (415) 243-4609 or Dave Mansen at Parsons (415) 490-2496 – the Authority's consulting team leaders on this project.

Thank you for your time and attention to this.

Sincerely,

Dan Leavitt
California High Speed Rail Authority

cc: Harlan Kelley, Jr.
Assistant General Manager, Infrastructure
SFPUC

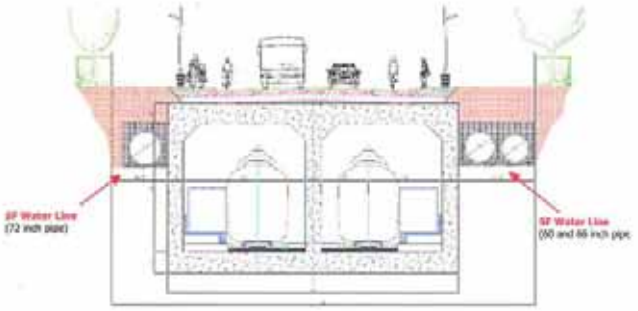
Letter from Dan Leavitt of the CAHSRA to San Francisco Public Utilities Commission (continued)

Letter from Dan Leavitt of the CAHSRA to San Francisco Public Utilities Commission (continued)

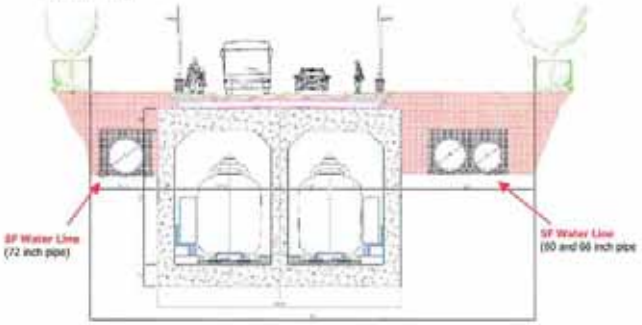
Mr. Ed Harrington
July 21, 2010
Page 4

Attachment 2: Proposed Typical Cross Sections, Newark and Fremont

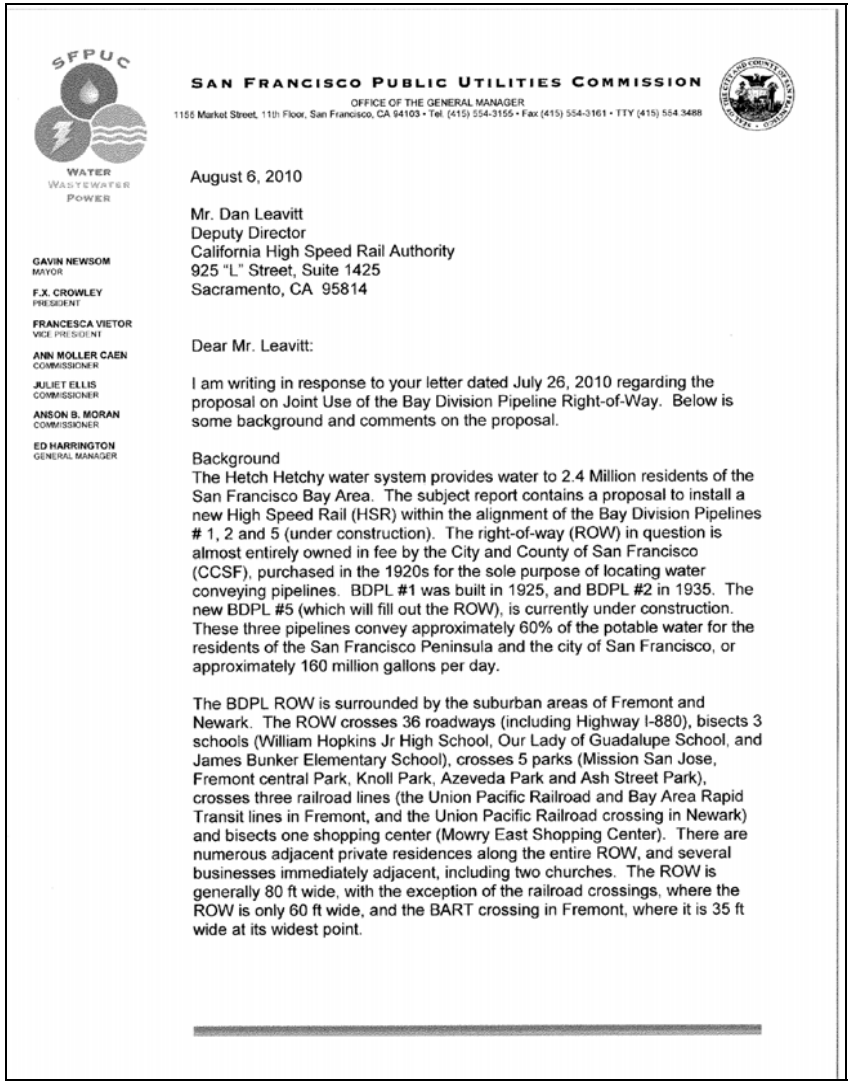
Cross section of Fremont route along SF PUC Water Line according to Section AP-4 (EIR/EIS – Appendix 2E):



According to French standards, the cross section of Fremont route along SF Water Line could be the following one:



Letter from Dan Leavitt of the CAHSRA to San Francisco Public Utilities Commission (continued)



SFPUC
WATER
WASTEWATER
POWER

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
OFFICE OF THE GENERAL MANAGER
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JULIET ELLIS
COMMISSIONER

ANSON B. MORAN
COMMISSIONER

ED HARRINGTON
GENERAL MANAGER

August 6, 2010

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

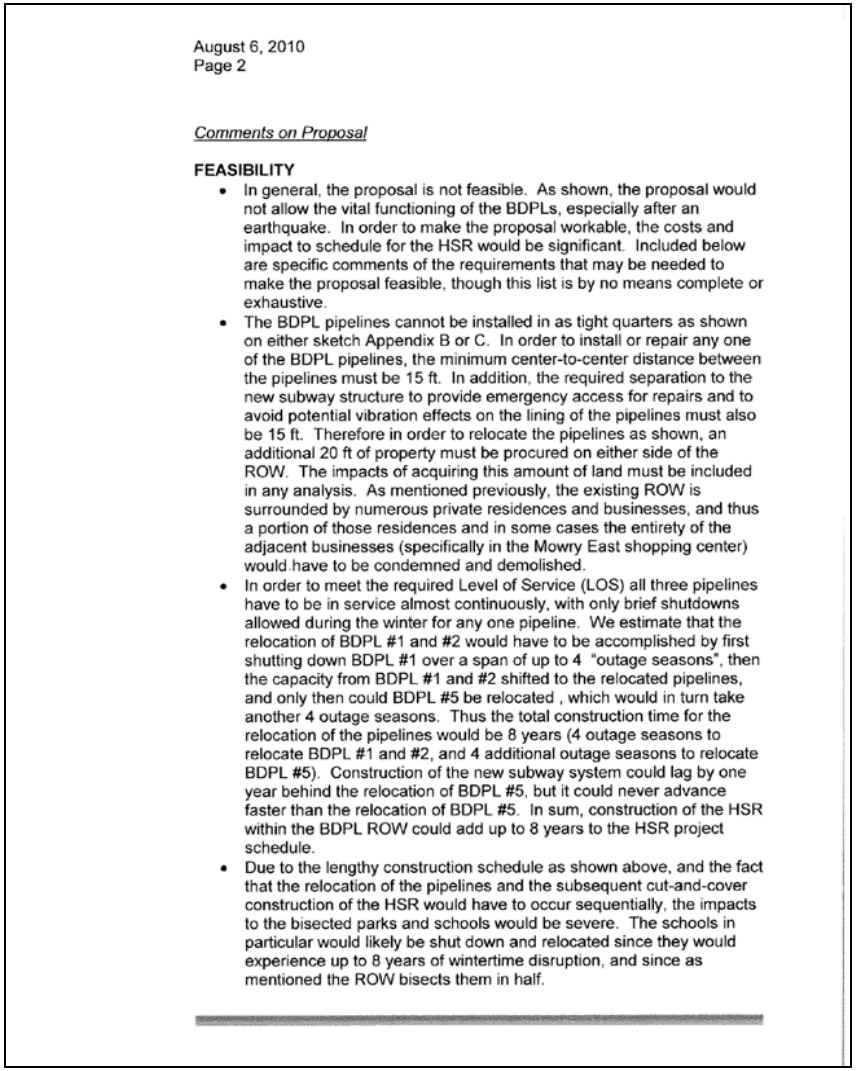
Dear Mr. Leavitt:

I am writing in response to your letter dated July 26, 2010 regarding the proposal on Joint Use of the Bay Division Pipeline Right-of-Way. Below is some background and comments on the proposal.

Background
The Hetch Hetchy water system provides water to 2.4 Million residents of the San Francisco Bay Area. The subject report contains a proposal to install a new High Speed Rail (HSR) within the alignment of the Bay Division Pipelines # 1, 2 and 5 (under construction). The right-of-way (ROW) in question is almost entirely owned in fee by the City and County of San Francisco (CCSF), purchased in the 1920s for the sole purpose of locating water conveying pipelines. BDPL #1 was built in 1925, and BDPL #2 in 1935. The new BDPL #5 (which will fill out the ROW), is currently under construction. These three pipelines convey approximately 60% of the potable water for the residents of the San Francisco Peninsula and the city of San Francisco, or approximately 160 million gallons per day.

The BDPL ROW is surrounded by the suburban areas of Fremont and Newark. The ROW crosses 36 roadways (including Highway I-880), bisects 3 schools (William Hopkins Jr High School, Our Lady of Guadalupe School, and James Bunker Elementary School), crosses 5 parks (Mission San Jose, Fremont central Park, Knoll Park, Azeveda Park and Ash Street Park), crosses three railroad lines (the Union Pacific Railroad and Bay Area Rapid Transit lines in Fremont, and the Union Pacific Railroad crossing in Newark) and bisects one shopping center (Mowry East Shopping Center). There are numerous adjacent private residences along the entire ROW, and several businesses immediately adjacent, including two churches. The ROW is generally 80 ft wide, with the exception of the railroad crossings, where the ROW is only 60 ft wide, and the BART crossing in Fremont, where it is 35 ft wide at its widest point.

Response to Authority from San Francisco Public Utilities Commission



August 6, 2010
Page 2

Comments on Proposal

FEASIBILITY

- In general, the proposal is not feasible. As shown, the proposal would not allow the vital functioning of the BDPLs, especially after an earthquake. In order to make the proposal workable, the costs and impact to schedule for the HSR would be significant. Included below are specific comments of the requirements that may be needed to make the proposal feasible, though this list is by no means complete or exhaustive.
- The BDPL pipelines cannot be installed in as tight quarters as shown on either sketch Appendix B or C. In order to install or repair any one of the BDPL pipelines, the minimum center-to-center distance between the pipelines must be 15 ft. In addition, the required separation to the new subway structure to provide emergency access for repairs and to avoid potential vibration effects on the lining of the pipelines must also be 15 ft. Therefore in order to relocate the pipelines as shown, an additional 20 ft of property must be procured on either side of the ROW. The impacts of acquiring this amount of land must be included in any analysis. As mentioned previously, the existing ROW is surrounded by numerous private residences and businesses, and thus a portion of those residences and in some cases the entirety of the adjacent businesses (specifically in the Mowry East shopping center) would have to be condemned and demolished.
- In order to meet the required Level of Service (LOS) all three pipelines have to be in service almost continuously, with only brief shutdowns allowed during the winter for any one pipeline. We estimate that the relocation of BDPL #1 and #2 would have to be accomplished by first shutting down BDPL #1 over a span of up to 4 "outage seasons", then the capacity from BDPL #1 and #2 shifted to the relocated pipelines, and only then could BDPL #5 be relocated , which would in turn take another 4 outage seasons. Thus the total construction time for the relocation of the pipelines would be 8 years (4 outage seasons to relocate BDPL #1 and #2, and 4 additional outage seasons to relocate BDPL #5). Construction of the new subway system could lag by one year behind the relocation of BDPL #5, but it could never advance faster than the relocation of BDPL #5. In sum, construction of the HSR within the BDPL ROW could add up to 8 years to the HSR project schedule.
- Due to the lengthy construction schedule as shown above, and the fact that the relocation of the pipelines and the subsequent cut-and-cover construction of the HSR would have to occur sequentially, the impacts to the bisected parks and schools would be severe. The schools in particular would likely be shut down and relocated since they would experience up to 8 years of wintertime disruption, and since as mentioned the ROW bisects them in half.

Response to Authority from San Francisco Public Utilities Commission (continued)

- There is no mention in the report as to how the HSR would cross the 36 roads or the railroads, the BART and the Highway I-880 locations. If tunneling is selected, there is no location available for access portals of a size required for even the smaller Appendix C alternative (the French Standard).

POSSIBLE IMPACTS TO CURRENT AND PLANNED FACILITIES

- As mentioned, the ROW currently contains BDPL #1 and #2, and will shortly contain BDPL #5. There is no discussion in the report as to the specific impacts to the BDPL pipelines, however, the following are items that would need to be satisfactorily addressed:
  - Vibration impacts that could damage the lining of the BDPL pipelines
  - Corrosion impacts and induced currents on the BDPL pipelines from the high voltage power lines contained within the HSR subway structure
  - Access impacts (as noted above, this would require an additional property on either side of the ROW)
- In addition to the pipelines themselves, the ROW contains 4 major crossover vaults (which contain large valves that allow water to be transferred during an emergency from one pipeline to the adjacent pipeline), 2 on either side of the Hayward fault. These structures are vital to the operation of the system after an earthquake. The crossover facilities would need to be replaced, potentially above the HSR subway structure, requiring a much deeper subway structure than is shown.
- There are also numerous service connections connecting to all three pipelines that would have to remain in service during and after construction.

REGULATIONS AND PROCEDURES TO WORK IN THE VICINITY OF SFPUC FACILITIES

- The BDPL pipelines convey potable water, and are thus regulated by the California Department of Public Health (CDPH). The pipeline standards are established by the American Water Works Association (AWWA).
- Aside from the applicable state and federal regulations and internal SFPUC standards, the BDPL pipeline crossings at certain locations are regulated by the following entities:
  - The California Department of Transportation (CALTRANS), for the Mission Blvd and Highway I-880 crossings
  - The Bay Area Rapid Transit District (BART), for the BART rail crossing in Fremont
  - The Union Pacific Railroad (UPRR) for railroad crossings in Fremont and Newark

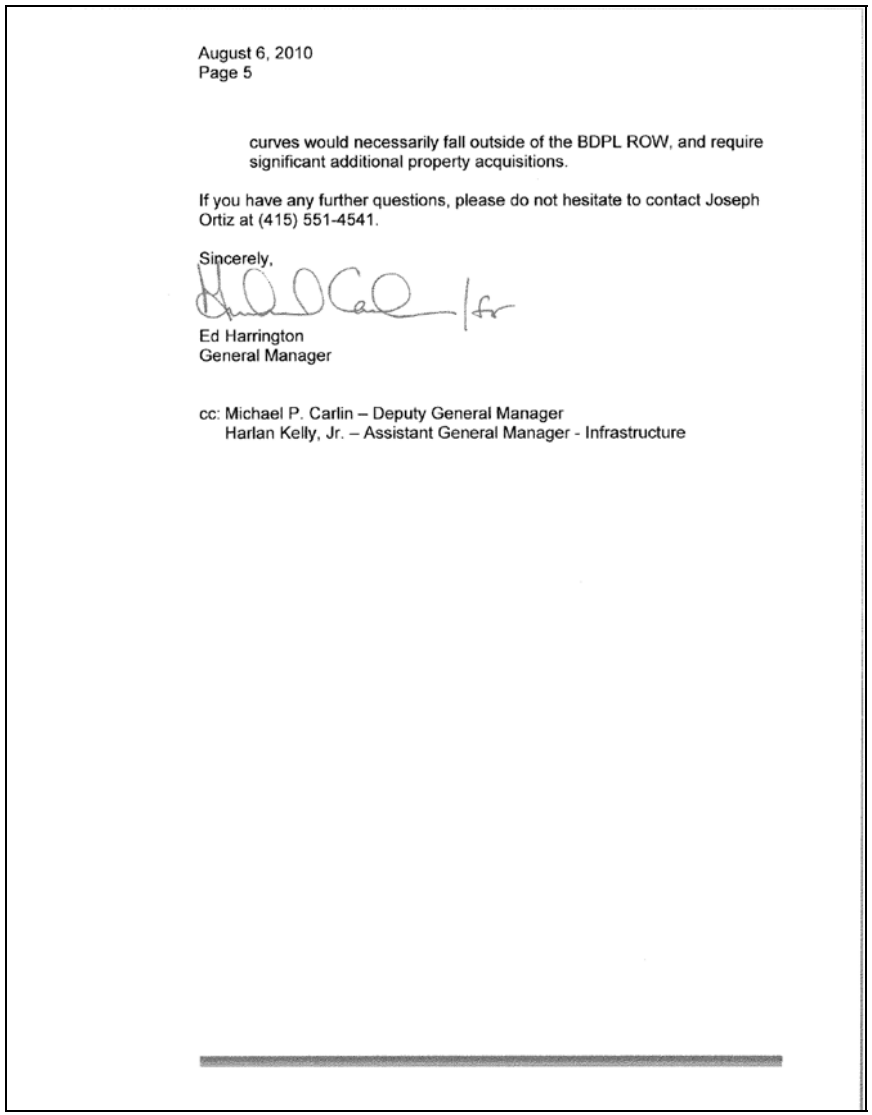
Response to Authority from San Francisco Public Utilities Commission (continued)

  - The California Department of Fish and Game (CDFG), for Mission Creek, Muskrat Creek, and several unnamed drainages
  - The Alameda County Flood Control District, for crossings of several flood control channels
  - The City of Newark, for several crossings within Newark not owned in fee by CCSF

OTHER COMMENTS

- There is no mention made of the Hayward Fault Crossing in the vicinity of Paseo Padre Parkway in Fremont. While any relocated pipeline could be designed for the estimated 5 ft of design fault offset for a magnitude 7.0 earthquake on the Hayward fault, it isn't clear how the HSR subway structure could be designed for such an offset without catastrophic failure. Also please note that we estimate that a failure of even the smallest BDPL pipeline after an earthquake could potentially release up to 4 million gallons of water before the automatic shutoff valves can completely shut off the flow. The report is silent on any contingency for the HSR to deal with this potential flow.
- It is not clear why the cross sections denoted Appendix B and C appear to show a roadway over the new HSR structure. The existing ROW does not contain a roadway, and there is no reason to construct a new roadway. As noted, the access requirements for maintenance and repair of the BDPL pipelines preclude any roadway.
- There are countless utilities that cross the BDPL ROW corridor. During the construction of BDPL #5, all the utilities were found to be within the top 20 ft of the excavation. This includes large petroleum and natural gas transmission lines that serve the City of Oakland and Oakland International Airport. Additionally, SFPUC's customer turnouts are within the elevation of the subway shown in the cross sections. Based on the conceptual subway cross section, all these utilities would have to be relocated 30' deep or the subway lowered such that the existing utilities can cross over.
- Although the report only shows a subway structure, the same comments would apply to an at-grade or elevated track alternative. The BDPL pipelines would have to be relocated under any alternative in order to maintain emergency access. However, it may be possible to avoid relocating the 4 crossover vaults under an elevated track design.
- The report appears to assume that the BDPL ROW is perfectly straight, when in fact it has several major "kinks" (specifically at Blacow road in Fremont, at Central Avenue in Newark, and at Locust St in Newark), and numerous smaller kinks. Again, while this is not an issue for pipelines, the proposed HSR would likely need extremely long radius curves to handle these abrupt changes in alignment. Such

Response to Authority from San Francisco Public Utilities Commission (continued)



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Page 5

curves would necessarily fall outside of the BDPL ROW, and require significant additional property acquisitions.

If you have any further questions, please do not hesitate to contact Joseph Ortiz at (415) 551-4541.

Sincerely,

Ed Harrington
General Manager

cc: Michael P. Carlin – Deputy General Manager
Harlan Kelly, Jr. – Assistant General Manager - Infrastructure

Response to Authority from San Francisco Public Utilities Commission (continued)

SAN JOSE CONNECTION FROM FREMONT

As noted in the Setec report, there is a variety of possible corridors between Fremont and San Jose that were studied by the Authority as part of the 2008 Final Program EIR

Former WPRR Rail Line Alignment Alternative (Warm Springs to San Jose): The former WPRR (the Milpitas subdivision) has been sold to the Santa Clara Valley Transportation Authority (VTA) for the BART link between Warm Springs to San Jose. This right-of-way is relatively narrow, with some sections at approximately 60 feet. Purchase of additional ROW necessary to widen the corridor sufficiently for both the planned San Jose BART extension and an HST alignment alternative with full grade separation Bay Area to Central Valley HST Final Program EIR/EIS would result in acquisition and relocation of numerous residential and industrial land uses with corresponding significant impacts. Because alignment alternatives exist that would not result in these adverse relocation impacts, this WPRR alignment alternative is not viewed as practicable.

Interstate 880: In the 2008 Final Program EIR, the Authority did study the I-880 corridor from Fremont to San Jose as part of both the Niles Subdivision Line to I-880 (Niles/I-880) alternative and the Niles Subdivision Line to I-880 to Trimble Road (Niles/I-880/Trimble Rd.) alternative. The alignment would on an aerial structure in the median of I-880. The I-880 HST portion would mostly be on an aerial configuration from Fremont to San Jose. This alignment would require the construction of columns and footings in the wide median of I-880.

Altamont Pass Project: The Authority is pursuing a partnership with "local and regional agencies and transit providers" to propose and develop a joint-use (Regional Rail and HST) infrastructure project in the Altamont Pass corridor—as advocated in MTC's recently approved "Regional Rail Plan for the San Francisco Bay Area." Regionally provided commuter overlay services would require regional investment for additional infrastructure needs and potentially need operational subsidies. The Authority cannot unilaterally plan for regionally operated commuter services.

BAY CROSSING AT DUMBARTON

The SETEC Alternative involves a crossing of the San Francisco Bay at Dumbarton on a new bridge structure. The report confirms the Authority's prior conclusion, that the existing Dumbarton Rail Bridge is in sufficiently poor condition that a new bridge would have to be constructed for HST tracks. The Setec Alternative suggests a high central pier bridge structure. The 2008 Program EIR evaluated both a high and low bridge crossing at Dumbarton, and therefore this component of the Setec Alternative is similar to the portions of various Altamont Pass alignment alternatives. Please see also response O012-12 for more discussion regarding a rail crossing at Dumbarton.

USE OF 101 FROM REDWOOD CITY TO SOUTH SAN FRANCISCO

The US-101 Alignment alternative with withdrawn from further consideration for the reason given below.

US-101 Alignment Alternative: this alignment alternative would follow the US-101 freeway alignment south to San Jose and be on an exclusive guideway in the US-101 corridor. This exclusive guideway alignment would have major construction issues involving the construction of an aerial guideway adjacent to and above an active existing freeway facility while maintaining freeway traffic. Limited right-of-way in this corridor would require the extensive purchase of additional right-of-way and nearly exclusive use of an aerial structure between San Francisco and San Jose. In San Francisco, major new tunnel construction would be required.

The US-101 alignment alternative would require many sections of high-level structures to pass over existing overpasses and connector ramps, resulting in high construction costs and constructability issues that would make this alignment alternative impracticable. This alignment alternative would also require relocating and maintaining freeway access and capacity during construction. The aerial portions would introduce a major new visual element along the US-101 corridor that would have visual impacts (intrusion/shade/shadow) on the residential portions for this alignment alternative. In addition, the freeway has substandard features (e.g., medians and shoulders) in many places, and it is assumed that any room that might be

available for HST facilities likely would be used by Caltrans to upgrade the freeway in these areas.

In summary, the Setec Alternative offered in Exhibit C makes certain trade-offs that do not offer any significant benefit above alignment and network alternatives studied as part of the 2008 Final Program EIR for Altamont.

In most locations, the alignments share the same characteristics:

- There is a crossing of San Francisco Bay at Dumbarton.
- Newark and Fremont must are crossed using a rail or utility corridor
- Tunneling is required between Fremont and the I-680 corridor near Pleasanton/Sunol
- A new crossing of Altamont or Patterson Pass is made
- Tracy is crossed on/near a UPRR right-of-way (it is unclear in Exhibit C but the alignment shown on Plan 5, while it ends at I-580, it is aligned to meet the UPRR line running south of Tracy)

The alignment characteristic that differs between those studied in the 2008 Final Program EIR and Exhibit C is how the alignments differ in their path in the area of Pleasanton and Livermore. The CHSRA alignment alternatives follow existing transportation corridors, either I-680 and I-580 or the UPRR. The Setec Alternative C attempts to follow a powerline corridor, but that corridor is in a rural and agricultural area. The impacts and benefits of the CHSRA alignments in urbanized areas are traded for Exhibit C's impacts and benefits of a rural alignment. Evidence of some of the obvious potential impacts of Exhibit C's alignment have been presented above. There is no benefit that stands in favor of the entire alignment verses the Altamont alignments already considered in the 2008 Final Program EIR.

Given that the tangible differences between the Altamont alignments studied in the 2008 Final Program EIR and the Setec Alternative are small, we do not believe the Setec Alternative alters the basic comparison between Altamont Pass and Pacheco Pass network alternatives that serve both San Francisco and San Jose. We do not believe the Setec Alternative merits further consideration.

O012-12

The comment refers to Exhibit D, E, and F of the comment letter for the proposition that the EIR must re-evaluate the cost and practicability of a new, two track Dumbarton rail bridge. The commenter's Exhibit D states that the existing Dumbarton Bridge's "proposed use as access for high speed inter-city trains to The City of San Francisco and as an additional commuter rail route would not necessarily require double-tracking." The commenter adds, "double tracking would ensure absolutely smooth operations and even provide for single- tracking as a back-up for maintenance and emergency situations. Hourly high speed trains in each direction will be no problem at all for such a bridge. A possible commuter service initially established with four peak direction trains to San Francisco in the two-hour morning peak and four returning in the evening would be easy to add."

It is unclear what the length of single- or double-track railway is assumed by the author of Exhibit D. The statement "Hourly high speed trains in each direction will be no problem at all for such a bridge" shows a lack of understanding of the basics of the proposed HST project. The Program EIR envisions a service level of 248 trains per day which is far more than 2 trains per hour (tph). Assuming complete double-tracking, electrification and HST signaling for the entire Dumbarton corridor, blending commuter services in with HST service would require the following conditions to be met:

Additional HST compliant commuter service would require a one-to-one reduction in HST train paths for every HST-compliant commuter train added, as 12 tph is towards the top limit of the feasible capacity of a rail system based on operating at 5 minute headways..

- Additional HST compliant commuter service would need to operate at the same speed and with similar acceleration as HST
- Each commuter station would require an additional two tracks to pull off the mainline to allow HST to pass

- Junctions at each end of the Dumbarton corridor would need to be grade separated to eliminate conflicts between trains leaving the HST mainline.
- Crossings of Newark Slough and San Francisco Bay are not operable (swing or lift) bridges

We disagree with the comment that a swing bridge or draw bridge would be appropriate as part of the HST system. This point was address in the Final Program EIR and in the Town of Atherton final court judgment. We note that the commenter's Exhibit C and Exhibit E support this position that operable bridges are not appropriate for HST.

Exhibit E states "very few VTS San Francisco Vessel Movement Reporting System Users (VMRS Users) report transiting through the Dumbarton Bridge… …I have no idea how many recreational vessels or other non-VMRS User vessels might transit through the bridge." While "very few" is likely a small number, it is not zero. Additionally, no verification of the number of recreational or non-VMRS vessels is given. Vessels, large and small, still pass the Dumbarton rail bridge. Other, smaller navigable waterways in the Bay Area are required to provide passage for vessels, including the Petaluma River and Napa River. Within the past five years, the 1949 Maxwell Bridge lift-span on SR 121 in the City of Napa was replaced with a new high level bridge.[2] Accordingly, we do not agree that the high bridge discussed in the Program EIR is "far in excess of what is needed."

The comment letter's Exhibit C states "The capital expenditure of construction of a lift-span for a bridge of 800m (2625 ft) is about 20% more expensive than the cost of high central piers. The operation expenditure of a lift-span bridge is also higher. For these reasons, the small incremental capital cost of a high central pier structure, similar in form to the nearby bridge of SR-84, appears worthwhile"

Construction and operation of a high bridge would be less than that of an operable span, according to the submitted exhibit.

[2] Traffic study reference included in reference folder

Finally, we note that neither the comment nor the exhibits address the wildlife refuge crossing issues associated with a rail crossing at Dumbarton. As noted in the 2008 Final Program EIR Response to Comment O007-22:

> *"… The HST alignments that cross the Bay along the Dumbarton corridor would have a significant impact on the bay and its aquatic resources, including wetlands and sensitive plant and wildlife species in addition to the Refuge. Much of the area surrounding the bay is already protected and there are challenges for developing substantial mitigation strategies. The preferred Pacheco Pass network alternative identified by the Authority would not require a bay crossing, would not affect any established Refuge, and would result in fewer impacts on wetlands and aquatic resources than the Altamont Pass network alternatives. The Pacheco Pass network alternative, although it would pass through the area identified as the GEA, would have less impact than would crossing the Bay and the Refuge. The magnitude of impacts on biological resources of the Bay crossing would be greater than the impacts along the Pacheco alignment. In the area along Henry Miller Road and through the Diablo Range, the Authority would work with stakeholders in developing mitigation that would benefit the GEA and surrounding area. In addition, engineering design refinements would be undertaken to avoid and/or minimize environmental impacts. This will include evaluating design alternatives to the north and south of the current proposed Henry Miller alignment (between the Central Valley and the Pacheco Pass).*
>
> *The potential to induce growth within the GEA or the Los Banos area would be limited because no station or maintenance facility would be located in this area. The closest proposed stations are located in Merced and Gilroy. Growth-inducing impacts are discussed in Chapter 5.*
>
> *As noted above, the HST system would not be compatible with the Dumbarton Rail service technology and would require more tracks. A tunnel or high bridge across the Bay*

to replace the current Dumbarton rail bridge would require a larger tunnel or bridge and have larger potential impacts on the Bay and the Don Edwards Refuge and result in higher costs. A tunnel would not necessarily remove all impacts on the bay or refuge.

The Authority received comments signed by five members of Congress and four members of the California Legislature stating that any alternative requiring construction through the refuge with additional impacts on the Bay and Palo Alto shore of the Bay should be rejected. The City of Fremont opposes the Dumbarton alternatives because of the potential impacts on Fremont neighborhoods."

Exhibit C does not note that the Don Edwards National Wildlife Refuge is home to three endangered species, the California Clapper Rail, California Least Tern and Salt Marsh Harvest Mouse. The abandoned embankment across the refuge has been completely overtaken by vegetation, and likely the endangered species. Regulations governing access to the refuge have lead the San Francisco Public Utilities Commission, SFPUC, to plan to abandon their pipeline facilities parallel to the Dumbarton rail bridge once they complete construction of a new bored-tunnel that will carry their pipes beneath the refuge and San Francisco Bay. This is not just over a concern for construction access- maintenance access is so heavily regulated within the refuge boundaries as to be almost impractical. Construction of a twin-tracked HST alignment and any type of bridge, lift- or high-level, if allowed, would be heavily burdened with restrictions governing construction times and methods.

The crossing from the west side of the bay to the east in the vicinity of Dumbarton Point is not only an issue of what type of bridge or tube to use. Of the approximately 4.5 miles from the University Avenue crossing in East Palo Alto to the Newark city limits, only about 1.4 miles involve crossing open water. The remaining 3.1 miles require building through the Refuge and would have potential direct impacts on 15 special-status plant and 21 special-status wildlife species.

These issues contributed substantially to the determination in the Program EIR that there were significant issues associated with a new Dumbarton crossing.

O012-13

The discussion in the Revised Draft Program EIR about significant impacts on the Monterey Highway does not require examination of further alternatives. The Program EIR examines 21 representative network alternatives for connecting the Central Valley and the San Francisco Bay Area. The Altamont Pass network alternatives represent a method for eliminating the traffic impacts on the Monterey Highway associated with the preferred Pacheco Pass Network Alternative serving San Francisco via San Jose. **The range of alternatives in the Program EIR complies with CEQA.**

O012-14

In the case Peterson v. California High-Speed Rail Authority the Superior Court sustained a demurrer without leave to amend in June 2010. We do not agree that the suit forms a basis for the study of additional alternatives at the program level and note that the Superior Court in the Town of Atherton case concluded the Program EIR evaluated a reasonable range of alternatives. The Authority is aware of the trackage rights agreement between the PCJPB and UPRR. This agreement is identified in the Revised Draft Program EIR in Chapter 3.2.2, including UPRR's retained rights under that agreement for freight in the San Francisco to San Jose corridor. The text on page 3-3 has been clarified to acknowledge UPRR's rights as to intercity passenger service. The trackage rights agreement and an amendment thereto are listed as references to Chapter 3. We do not concur that it is unlikely UPRR will negotiate in good faith regarding HST service on the Peninsula. UPRR's February 23, 2009, scoping comments for the project-level EIR/S for the HST section between San Francisco and San Jose identify a host of UPRR concerns about operations in that corridor, but do not indicate that UPRR is unwilling to allow HST service on the corridor if their concerns are addressed. That letter states, "Union Pacific is confident that its concerns listed herein will be fully address and mitigated by the Authority and FRA during the EIR/EIS process." In

addition, UPRR's April 23, 2010, letter commenting on the Revised Draft Program EIR did not address the alignment between San Francisco and San Jose or its intercity passenger rights. Discussions between the Authority and UPRR are ongoing to explore how the HST system can be developed in a manner that meets the Authority's needs and respects UPRR's operations and rights.

O012-15

The US-101 alternative was considered and rejected in the 2005 Statewide Program EIR and the conclusion was restated in the 2008 Final Program EIR. Below is a discussion of why the alternative was considered and rejected.

The US-101 Alignment from San Francisco (Transbay Terminal or 4th and King Terminal Station), would follow the US-101 freeway alignment south to San Jose and would use an exclusive guideway in the US-101 corridor. This exclusive guideway alignment would likely require construction of an aerial guideway adjacent to and above an active existing freeway facility while maintaining freeway traffic. In addition, limited right-of-way would require the extensive purchase of additional right-of-way (at least 50 feet wide) and a nearly continuous aerial structure between San Francisco and San Jose. In San Francisco, major new tunnel construction would be required.

The US-101 alignment alternative would require many sections of high-level structures to pass over existing overpasses and connector ramps, resulting in high construction costs and constructability issues that make this alignment alternative impracticable. An elevated HST line above the Millbrae Avenue overcrossing and I-380 interchange would intrude into the FAA airspace at the end of the SFO runways, which would be a potential fatal flaw to HST above the median of US-101 in the vicinity of SFO. This alignment alternative would also require relocating and maintaining freeway access and capacity during construction. The aerial structures would introduce a major new visual element along the US-101 corridor that would have visual impacts (intrusion/shade/shadow) on the residential portions of this corridor. In addition, the existing freeway has substandard features (e.g., medians and shoulders) in many places, and it would be unlikely that Caltrans would agree to use available right-of-way for HST facilities, reserving that space for future improvements to the freeway. Construction of a tunnel in San Francisco from the Transbay Terminal site to 17th Street would also be difficult because most of the tunnel would need to be built using compressed air techniques in soft Bay-fill ground. For these reasons, the US-101 corridor was rejected and is not a practicable alternative for HST service between San Jose and San Francisco.

The evaluation of an alternative on US-101 corridor presented in Exhibit C of this letter is extremely limited and preliminary, and the described alignment would significantly affect or limit the ability of the proposed system to meet the purpose and need of the project. The described alignment does not identify a feasible link to the SFO airport or to the Caltrain corridor for final approach into San Francisco. Moreover, the described alignment would connect with Caltrain only at San Francisco and San Jose Caltrain stations, which would significantly impact the utility of Caltrain as a feeder to the HST system, and therefore, would adversely impact the accessibility, ridership, and revenue of the HST system. The exhibit also presents the "ability" of the alignment to avoid sharing of tracks and other infrastructure with Caltrain as an advantage. However, a shared track and infrastructure would provide much-needed synergy between Caltrain and HST to improve the corridor in a mutually beneficial, effective, and efficient manner.

The US-101 alignment alternative will continue to be studied as part of the project-level environmental process for the San Francisco to San Jose section. I think this response has already been updated

O012-16

Please see Response to Comment L003-151.

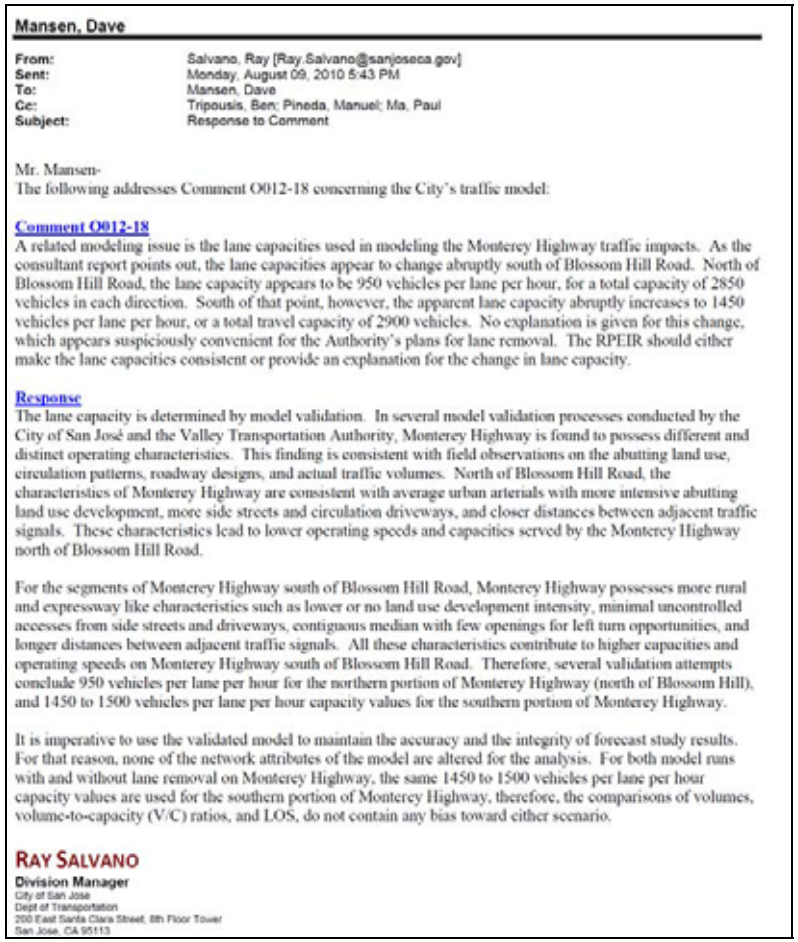
O012-17

To offer clarification, the sentence in Chapter 2 that read, "As discussed above in the Affected Environment, Monterey Highway in the San Jose to Central Valley Corridor is six lanes wide from Southside Drive to Blossom Hill Road, and four lanes wide south of Blossom Hill Road…" has been changed to read: "As discussed above in the Affected Environment, Monterey Highway in the San

Jose to Central Valley Corridor is six lanes wide from north of Fehren Drive to approximately Blossom Hill Road…"

O012-18

The City of San Jose Department of Transportation provided the following response to the Authority:



Mansen, Dave

From: Salvano, Ray [Ray.Salvano@sanjoseca.gov]
Sent: Monday, August 09, 2010 5:43 PM
To: Mansen, Dave
Cc: Tripousis, Ben; Pineda, Manuel; Ma, Paul
Subject: Response to Comment

Mr. Mansen-
The following addresses Comment O012-18 concerning the City's traffic model:

Comment O012-18
A related modeling issue is the lane capacities used in modeling the Monterey Highway traffic impacts. As the consultant report points out, the lane capacities appear to change abruptly south of Blossom Hill Road. North of Blossom Hill Road, the lane capacity appears to be 950 vehicles per lane per hour, for a total capacity of 2850 vehicles in each direction. South of that point, however, the apparent lane capacity abruptly increases to 1450 vehicles per lane per hour, or a total travel capacity of 2900 vehicles. No explanation is given for this change, which appears suspiciously convenient for the Authority's plans for lane removal. The RPEIR should either make the lane capacities consistent or provide an explanation for the change in lane capacity.

Response
The lane capacity is determined by model validation. In several model validation processes conducted by the City of San José and the Valley Transportation Authority, Monterey Highway is found to possess different and distinct operating characteristics. This finding is consistent with field observations on the abutting land use, circulation patterns, roadway designs, and actual traffic volumes. North of Blossom Hill Road, the characteristics of Monterey Highway are consistent with average urban arterials with more intensive abutting land use development, more side streets and circulation driveways, and closer distances between adjacent traffic signals. These characteristics lead to lower operating speeds and capacities served by the Monterey Highway north of Blossom Hill Road.

For the segments of Monterey Highway south of Blossom Hill Road, Monterey Highway possesses more rural and expressway like characteristics such as lower or no land use development intensity, minimal uncontrolled accesses from side streets and driveways, contiguous median with few openings for left turn opportunities, and longer distances between adjacent traffic signals. All these characteristics contribute to higher capacities and operating speeds on Monterey Highway south of Blossom Hill Road. Therefore, several validation attempts conclude 950 vehicles per lane per hour for the northern portion of Monterey Highway (north of Blossom Hill), and 1450 to 1500 vehicles per lane per hour capacity values for the southern portion of Monterey Highway.

It is imperative to use the validated model to maintain the accuracy and the integrity of forecast study results. For that reason, none of the network attributes of the model are altered for the analysis. For both model runs with and without lane removal on Monterey Highway, the same 1450 to 1500 vehicles per lane per hour capacity values are used for the southern portion of Monterey Highway, therefore, the comparisons of volumes, volume-to-capacity (V/C) ratios, and LOS, do not contain any bias toward either scenario.

RAY SALVANO
Division Manager
City of San Jose
Dept of Transportation
200 East Santa Clara Street, 8th Floor Tower
San Jose, CA 95113

O012-19

The Authority disagrees that the noise impacts were not fully disclosed. The 2010 Revised Draft Program EIR Material addresses those topics identified in the final judgment for the Town of Atherton litigation as requiring corrective work under CEQA. The noise analysis in the 2008 Final Program EIR was not one of those topics. The noise analysis in the 2008 Final Program EIR, Section 3.4, was generally based on densities along the various alignments evaluated and was appropriate at the program level. As stated in this section, "Screening distances were applied from the center of alignments to estimate all potentially impacted land uses in noise-sensitive environmental settings." Given that the alignment in this area did not change but rather was more clearly defined in the 2010 Revised Draft Program EIR Material the noise evaluation did not change from the 2008 document. Mitigation strategies for noise are provided in Section 3.4.5 of the 2008 Final Program EIR. Overall, the noise evaluation and mitigation strategies would not change for this alignment. Detailed noise analyses will occur for the alignments and station locations at the project-level EIR/EIS. See also Standard Responses 3 and 5.

O012-20

Land use, property, and noise/vibration impacts along the San Francisco Peninsula were addressed in the 2008 Final Program EIR and the 2010 Revised Draft Program EIR Material at an appropriate level for program analysis. It is assumed in the 2008 Final Program EIR and 2010 Revised Draft Program EIR Material that Caltrain and HST would remain within the existing right-of-way at most locations, but some temporary construction detours for automobile traffic and shooflies (temporary detours for railway tracks) would be necessary. The specific design and subsequent impacts of temporary construction impacts cannot be assessed until at least 15% engineering design is complete and the full extent of impacts cannot be understood until 30% engineering design is complete during the project level analysis.

Specific noise and vibration impacts associated with the predominantly four track system currently planned for Caltrain and

HST service will be addressed as part of the project-level EIR/EIS when noise measurements and modeling (both for noise and vibration) will occur. A detailed impacts analysis of the addition of the HST service to the Caltrain corridor is currently underway as part of project level engineering and environmental analyses. See Standard Response 5.

Removal of eucalyptus trees and other mature trees along the Caltrain corridor will be avoided to the extent possible. Operational and construction impacts including those related to the removal of trees along the Caltrain corridor will be addressed as part of project-level EIR/EIS. Specific locations and the scale of impacts will be further examined in detail at the project level because they are a product of the HST system design, and the detail necessary to identify the presence of the impact, the level of significance, and mitigation can only be done at the project level. Mitigations for preservation of existing trees and other flora will be analyzed and reported at the project level.

See Chapter 5, Costs and Operations, of the 2010 Revised Draft Program EIR Material. The capital costs are representative of all aspects of implementation of the proposed HST system, including construction, right-of-way, environmental mitigation, and design and management services. The right-of-way costs include the estimated costs to acquire properties needed for construction of the HST infrastructure.

O012-21

We do not agree with the comment that the discussion in Chapter 4 of the Revised Draft Program EIR is ambiguous regarding impacts on UPRR freight operations. The discussion in section 4.1.5 explains that at the program level of detail, sufficient uncertainty exists about HST design to conclude that impacts to UPRR freight operations will not be significant in advance of mitigation strategies. With the application of identified mitigation strategies, however, the EIR explains that the project is not expected to result in adverse impacts to UPRR freight operations. The role of mitigation strategies in this final conclusion is clearly identified. Detailed information about how the mitigation strategies will be applied in cooperation with UPRR will be provided at the project level because a higher level of design detail is necessary than available at the program level. See also Responses to Comments in letter O002.

O012-22

In the San Francisco to San Jose Corridor, the Program EIR describes in chapter 3 that UPRR has trackage rights over the Caltrain Corridor to run freight trains. In Chapter 4, the Program EIR states the intent that UPRR will retain its current trackage rights in the corridor and use of business serving spurs would not be precluded. The text acknowledges the potential need for additional right of way in this corridor. The comment correctly identifies the text statement that the HST alignment near Gilroy would be at grade and sever one spur from UPRR. The design practices and mitigation strategies in Chapter 4 are sufficiently descriptive that they identify the role they play in avoiding impacts to freight spurs, including the Gilroy spur. The Authority will refine and apply mitigation strategies at the project level to address impacts to UPRR freight operations in whatever network alternative the Authority selects. A higher level of design detail is necessary to provide a more detailed discussion of impacts to UPRR freight operations.

O012-23

The 2010 Revised Draft Program EIR does not state that the HST would have no impact on UPRR's ability to add new spurs. Rather, it states: "With regard to the business implications of acquiring properties adjacent to the railroad operating rights-of-way that may prohibit or reduce the likelihood of future business-serving spurs and associated potential business opportunities for UPRR, the Authority is fully aware that there currently is no prohibition to acquiring property adjacent to existing privately-owned railroad rights-of-way.[3] UPRR will retain authority to serve those businesses on properties or track rights-of-way owned by the UPRR." As indicated in CEQA Guidelines section 15151, economic effects shall not be treated as

[3] The Authority understands that it must comply with the Federal Railroad Administration's and the State of California Public Utility Commission's provisions regarding the safety associated with a shared corridor.

significant effects on the environment in an EIR. The EIR accordingly did not identify limits on future expansion of UPRR's freight business as a significant effect on the environment in and of itself. The potential for limits on future expansion of UPRR freight operations to cause secondary environmental effects is speculative at the program level. A significantly higher level of project design is needed to identify whether and to what extent freight expansion may be limited or accommodated. This issue will be considered in project-level environmental documents. We further note that the Authority has included the potential for light and medium weight freight service as a potential component of the HST system. The environmental benefits of such freight service are likewise too speculative to identify at the program level, but will be examined further at the project level.

O012-24

The typical HST sections accommodate space for a safety barrier if needed. The location and extent of safety barrier can only be determined by project-level design in accordance with criteria to be established by the FRA. Additional information regarding the safe operation of HST is provided in Standard Response 9.

O012-25

We agree that the Authority Board must consider all evidence before it in making a new program decision. The Authority Board will consider the whole of the record before it in making a new program decision, including new materials submitted with this comment letter.

O012-26

The 2010 Revised Draft Program EIR Material addresses those topics identified in the final judgment for the Town of Atherton litigation as requiring corrective work under CEQA. Biological resources and wetlands was not one of those topics. This revised description of the HST alignment in the Revised Draft Program EIR clarifies that the HST tracks would be placed adjacent to, and not within, the right-of-way owned by UPRR in this area. The revised project description does not result in changes to the discussion of biological resources and wetland impacts as included in the May 2008 Final Program EIR, however, because the study area as discussed in Chapter 3.15 of the 2008 Final Program EIR extended out 1,000 ft in urban areas and 0.25 mile in rural areas on each side of the alignment. The impacts analysis in the 2008 Final Program EIR therefore remains valid.

In response to Exhibit J, the methods of impact evaluation in Section 3.15.1, including review of sensitive vegetation communities for the project at the program level, were developed with input from both state and federal resource agencies. The analysis of land cover was used to evaluate the effect on sensitive species at a program level and is considered appropriate. Also see responses to letter O007 in the 2008 Final Program EIR

The Authority disagrees that the analysis was "cursory" or that the choice of the Pacheco Pass alignment alternative was "shot in the dark". Section 3.15 discloses the direct and indirect impacts on biological resources and wetlands at a program level. Mitigation strategies for impacts are discussed in Section 3.15.5. This section notes that mitigation strategies are expected to substantially lessen or avoid impacts on biological resources and wetlands in many circumstances, but at the program level, sufficient information is not available to conclude with certainty that the mitigation strategies will reduce impacts on biological resources to a less-than-significant level in all circumstances. The 2008 Final Program EIR, therefore, concludes that impacts on biological resources would remain significant, even with the application of mitigation strategies. The Authority considers the information adequate for the decisions to be made and to meet CEQA and NEPA requirements.

Additional environmental analysis for multiple alternatives, including field surveys and habitat valuation will be conducted as part of the project-level EIR/EIS and will allow a more precise evaluation of impacts. When field surveys are conducted as part of the project-level analysis, specific biological values and ecosystem functions will be assessed, habitat connectivity and other wildlife movement corridors will be identified, specific impacts on biological resources and wetlands will be analyzed, and detailed mitigation measures

building off the strategies proposed in Section 3.15.5 of the 2008 Final Program EIR will be identified. See also Standard Response 3.

O012-27

The analysis of operational characteristics for the Altamont alignment alternative already reflects current high-speed train operation practices, including the advantages and disadvantages of train splitting and coupling, as well as the specific characteristics of the travel demand in California and the presence of the Altamont pass at the front gate of the Bay Area. In Europe and Japan, where 10% or less of all trains are split, this is done after major intermediate markets are served and the sections continue after a delay to smaller cities and towns. In contrast splitting on the Altamont route would delay the heavily loaded trains serving the largest California markets by up to 12 minutes depending on the circumstances. In such instances in Europe and Japan, direct service is strongly preferred, as was assumed in the Altamont analysis.

The Authority has consistently noted in previous responses that train splitting and coupling are used in Europe and Asia high-speed rail systems in 10% or less of the operations, generally in off-peaks and at the more-lightly-used ends of the line. To characterize this as stating that trains are "rarely" split is incorrect and hyperbolic. Neither has similarly exaggerated language as "highly negative" and "highly disfavored" been part of the Authority's discussion of the issue.

While the statement "... train frequencies to/from San Francisco and San Jose were reduced by roughly ½ with concomitant reduction in projected ridership...." is correct this does not mean that projected ridership dropped by 50%, nor that all markets dropped. One of the most affected markets, Bay Area to Los Angeles Basin dropped only 25%, and the Sacramento – Bay Area market actually increased 30%, as would be expected from the more direct routing.

The Authority agrees that splitting and coupling trainsets adds travel time to train operations, but the actual time needed can be longer than the three to five minutes cited in the comment. The first trainset to arrive actually spends 10 minutes at the platform, as the report cited states, with the second trainset arriving half way through that period to be coupled. In the other direction, where a train is split, the second trainset is at the platform for 6 minutes, with the first trainset leaving after three. Moreover, the referenced report did not consider that the California market demand is large enough for hourly non-stop double trainset trains, one to San Jose and the other to San Francisco. Stopping these non-stop trains at Fremont or Redwood City, and then accelerating back up to speed would add a further 3-4 minutes to the trip time.

The circumstances of splitting /coupling in European high-speed rail operations are not "precisely the type of circumstance that would occur during access to the Bay Area". In Europe and Japan, such operations occur at points where major markets have been reached, and trains are split to serve smaller cities and towns. Additionally, these operations tend to be in the off-peak when the demand for double trainsets is not present. By contrast in California, the Altamont is at the gateway to the Bay Area, and trains are near their peak loads, with the large majority of passengers destined to San Francisco and San Jose, beyond the point of peak. In fact there is enough demand that double trainsets can be filled during the peak hour, and express non-stop service is warranted from the LA Basin to both of the major Bay area cities. In such circumstances, the European and Japanese operators do not split their trains just to increase frequency, but run rapidly and express to the extent possible.

The benefits suggested for reducing operating costs, increasing frequency, and passenger capacity are not quantified in the cited report, but are likely to be quite small. In the total operating and maintenance cost of the system, the cost of train drivers is on the order of 1%. With numerous trains already operating as double trainsets because of projected demand, the need to add some drivers to handle the split trainsets within the Bay Area, and a significant number of trains not operating into the Bay Area (Sacramento to the LA Basin and San Diego), any change in number of drivers and cost savings will be very small. Frequency effects will be offset by longer trip times for the largest markets, and are in any case limited by the presence of numerous double trainsets planned to make direct runs in these largest markets. Finally the plan

already provides sufficient passenger capacity to handle the forecast traffic, and splitting and coupling trains would not provide any advantage on this score. Finally, we note that it is unlikely that the application of splitting and joining trains would benefit one alignment alternative over the other. Practically, only one such train split could be accomplished for each scheduled train operation. Limited and appropriate splitting of trainsets could be used for either the Altamont Pass or Pacheco Pass alternatives (at Fresno or Los Angeles for example). A key operational benefit of the Pacheco Pass is that it minimizes the number of HST network branches and splits.